FIG. 1

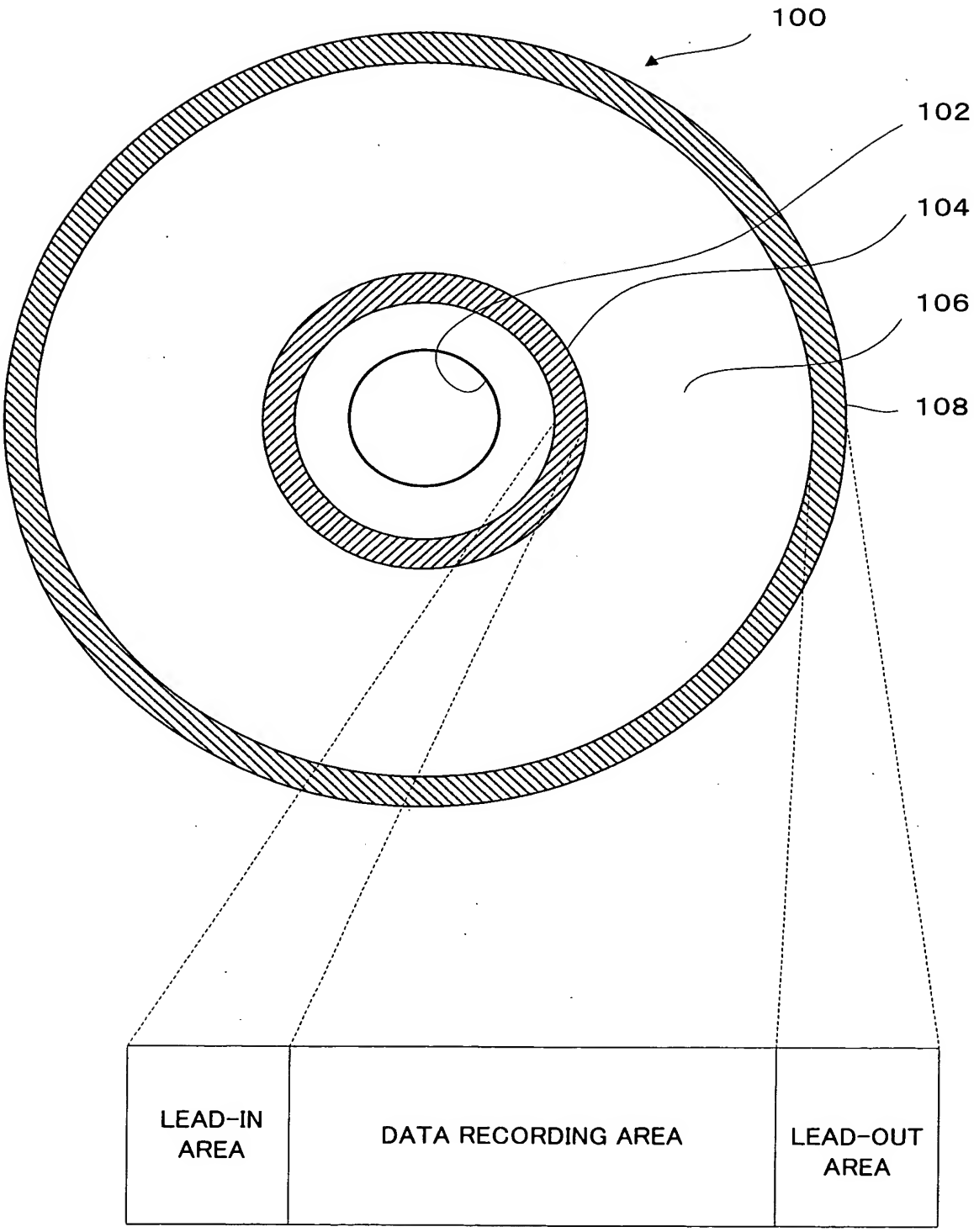

100
102
104
106
108
LEAD-IN AREA
DATA RECORDING AREA
LEAD-OUT AREA

FIG.2 (a)

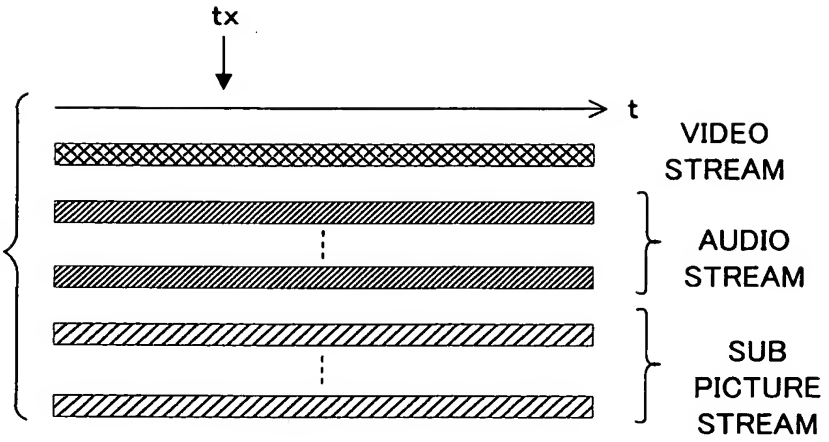


FIG. 2 (b)

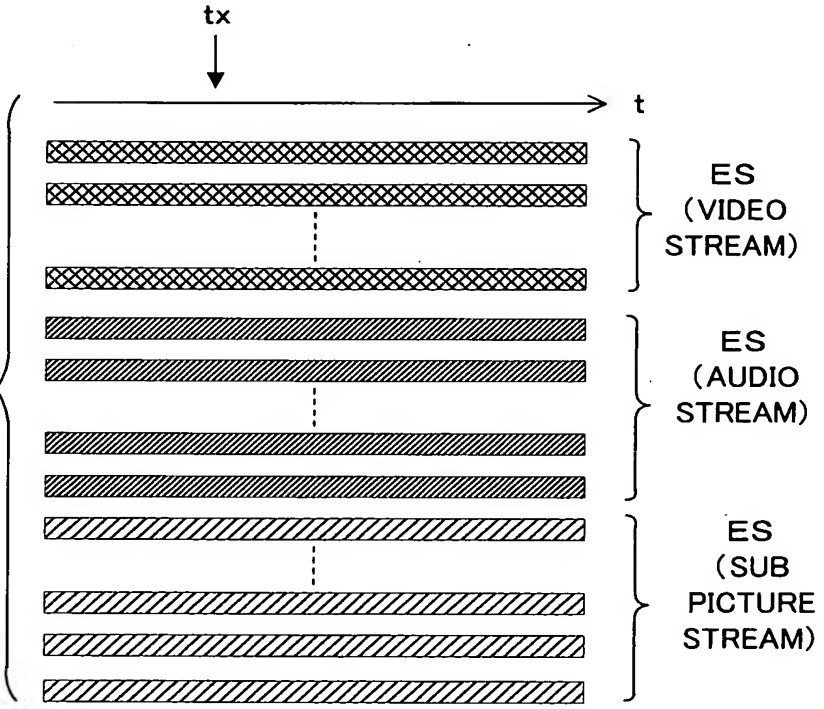


FIG. 2 (c)

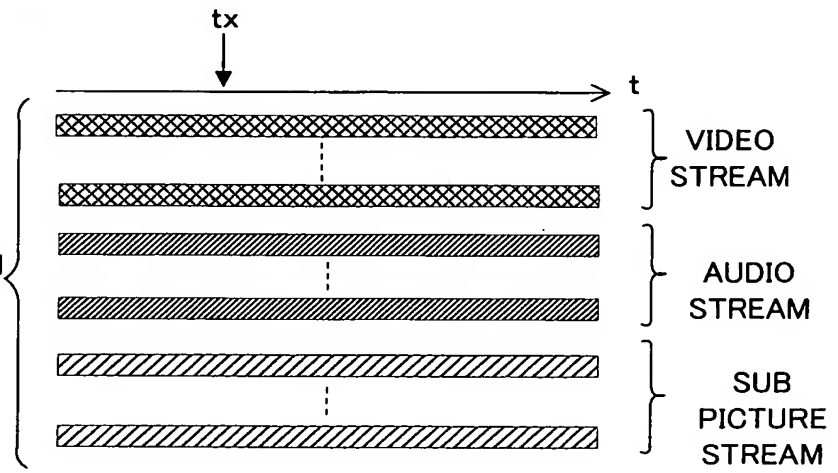


FIG. 3

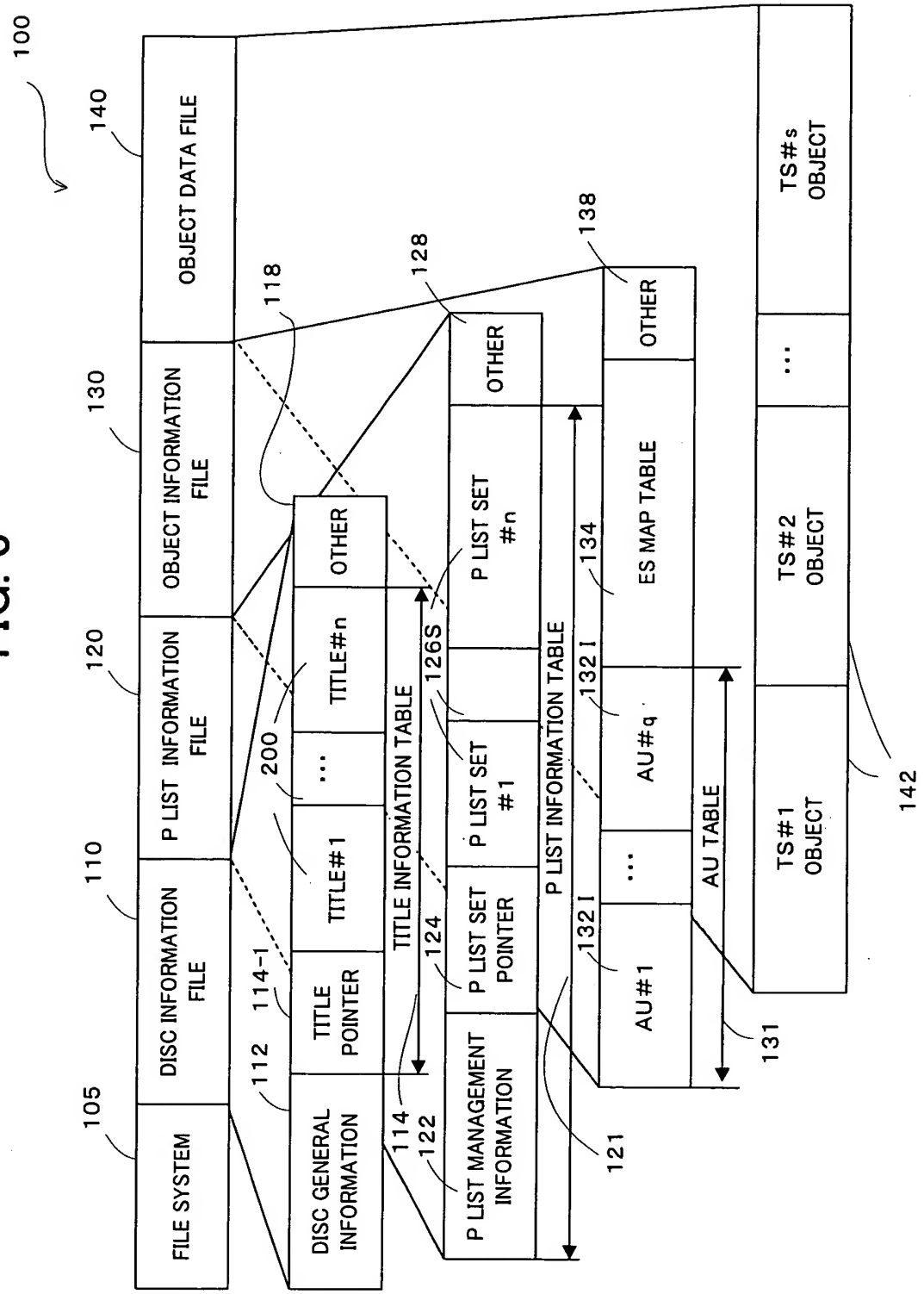

100
140
OBJECT DATA FILE
130
OBJECT INFORMATION FILE
120
P LIST INFORMATION FILE
110
DISC INFORMATION FILE
105
FILE SYSTEM
112
114-1
TITLE POINTER
DISC GENERAL INFORMATION
114
122
P LIST MANAGEMENT INFORMATION
124
P LIST SET POINTER
126S
P LIST SET #1
P LIST SET #n
128
OTHER
OTHER
118
200
TITLE#1
TITLE#n
...
TITLE INFORMATION TABLE
132 1
132 I
P LIST INFORMATION TABLE
134
ES MAP TABLE
138
OTHER
AU#1
AU#q
...
AU TABLE
131
121
TS#1 OBJECT
TS#2 OBJECT
...
TS#s OBJECT
142

FIG. 4

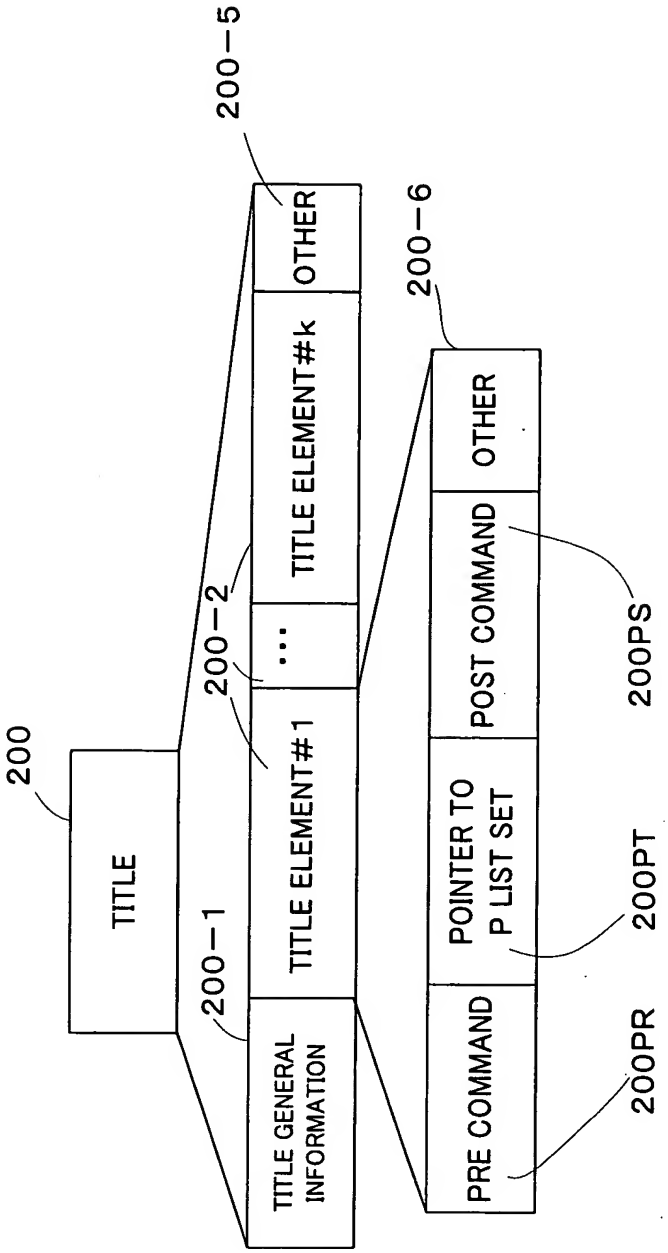

200
TITLE
200-1
TITLE GENERAL INFORMATION
200-2
TITLE ELEMENT#1
...
TITLE ELEMENT#k
200-5
OTHER
200-6
PRE COMMAND
200PR
POINTER TO P LIST SET
200PT
POST COMMAND
200PS
OTHER

FIG. 5

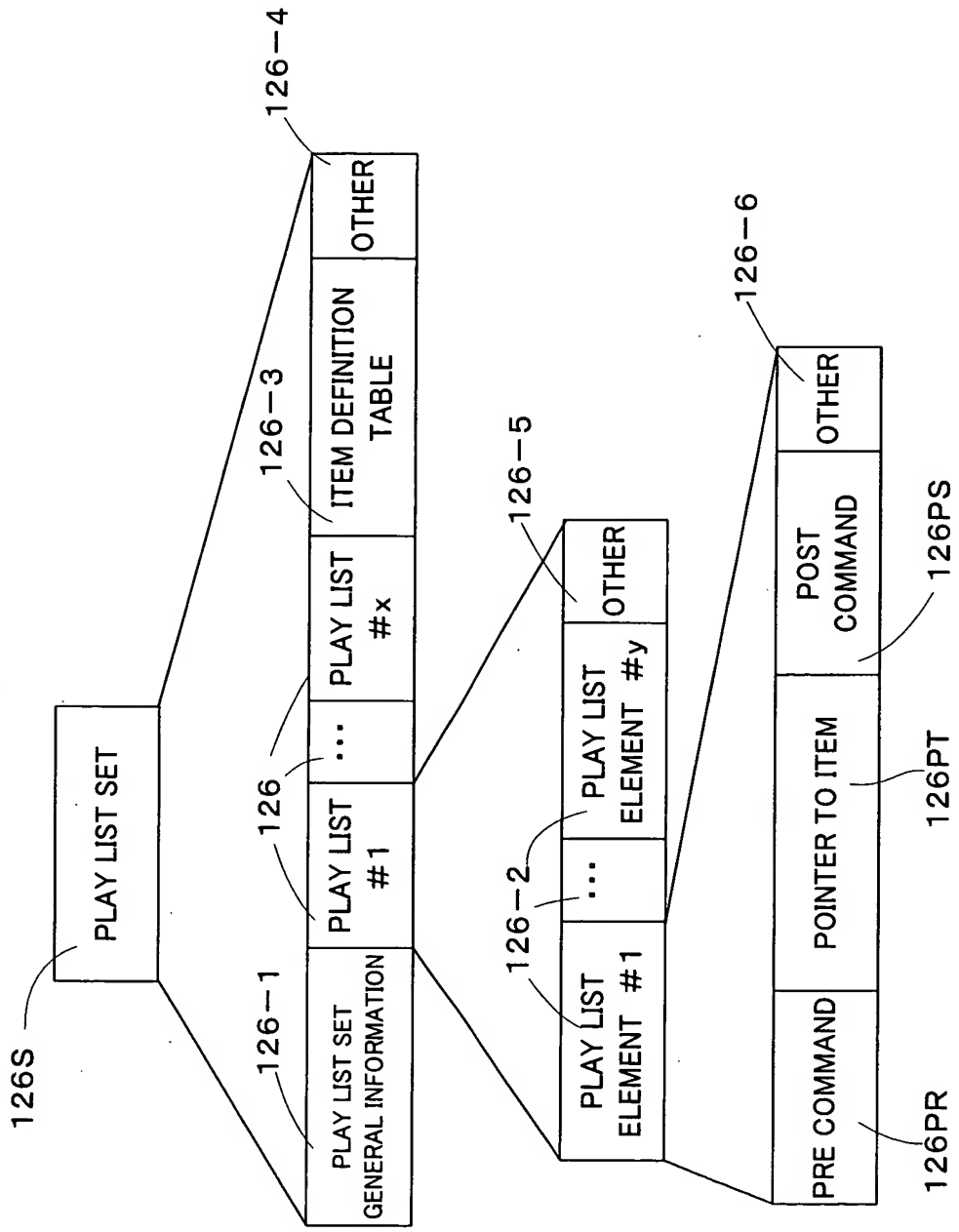

126S
PLAY LIST SET
126
126-1
PLAY LIST SET GENERAL INFORMATION
PLAY LIST #1
...
PLAY LIST #x
126-3
ITEM DEFINITION TABLE
OTHER
126-4
126-2
PLAY LIST ELEMENT #1
...
PLAY LIST ELEMENT #y
OTHER
126-5
126-6
PRE COMMAND
126PR
POINTER TO ITEM
126PT
POST COMMAND
126PS
OTHER

FIG. 6

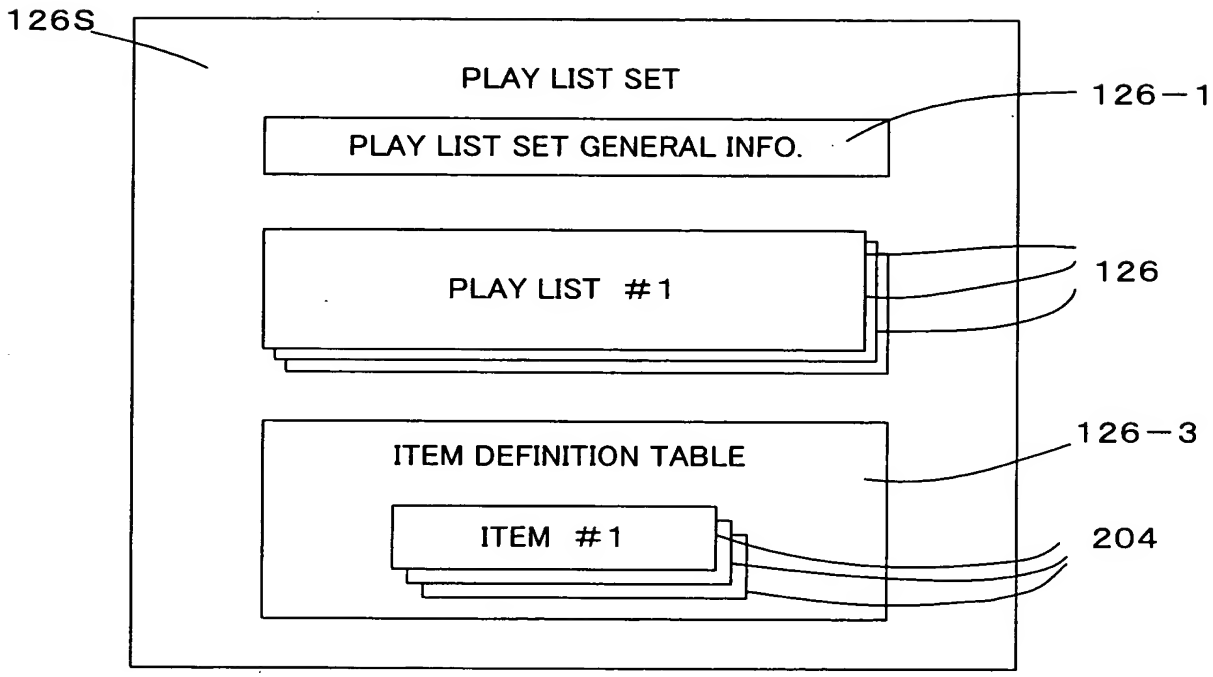

126S
PLAY LIST SET
126-1
PLAY LIST SET GENERAL INFO.
PLAY LIST #1
126
ITEM DEFINITION TABLE
126-3
ITEM #1
204

FIG. 7

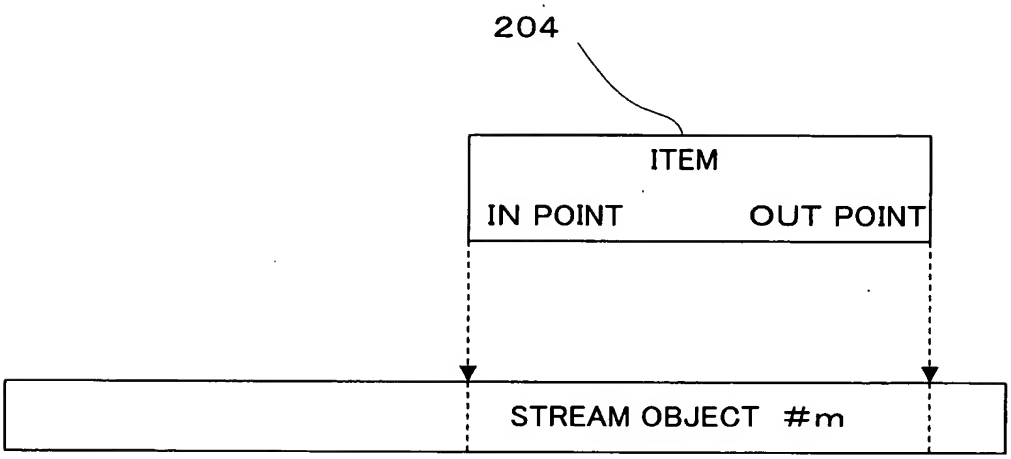


FIG. 8

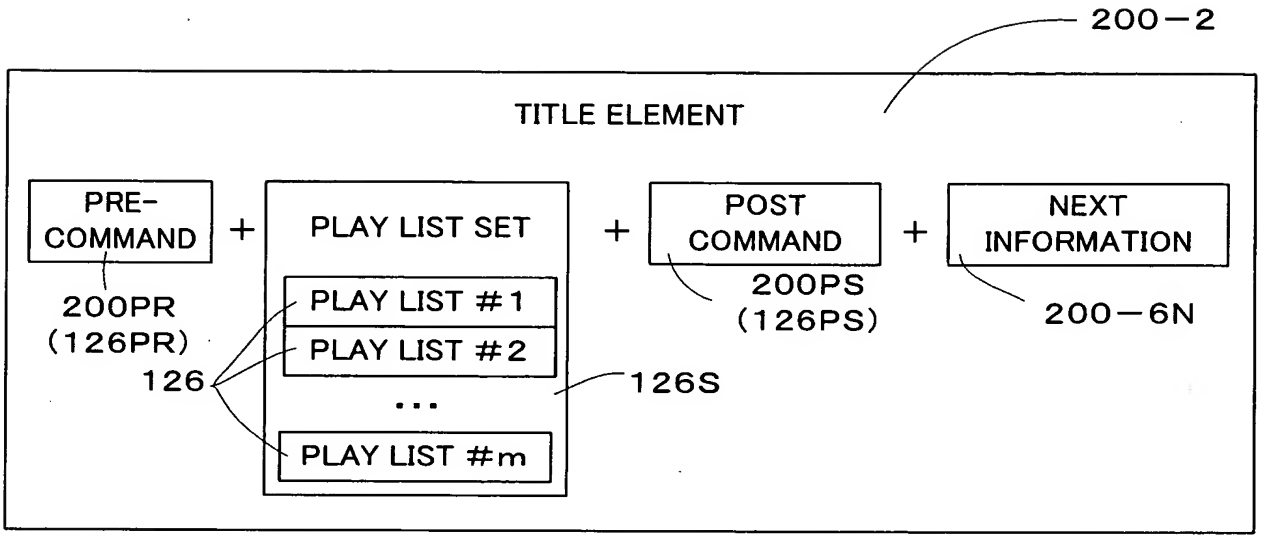

200-2
TITLE ELEMENT
PRE-COMMAND
+
PLAY LIST SET
+
POST COMMAND
+
NEXT INFORMATION
200PR
(126PR)
126
PLAY LIST #1
PLAY LIST #2
...
PLAY LIST #m
126S
200PS
(126PS)
200-6N

FIG. 9

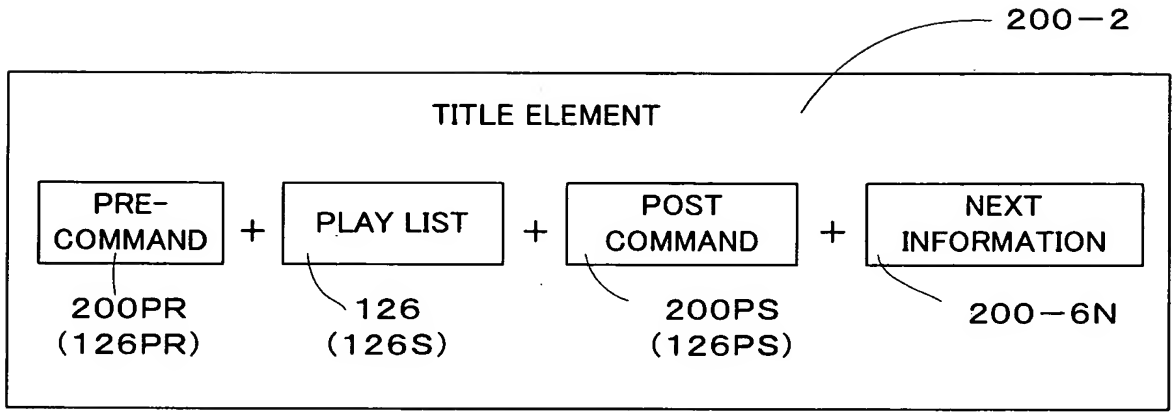

200−2
TITLE ELEMENT
PRE-COMMAND
+
PLAY LIST
+
POST COMMAND
+
NEXT INFORMATION
200PR (126PR)
126 (126S)
200PS (126PS)
200−6N

FIG. 10

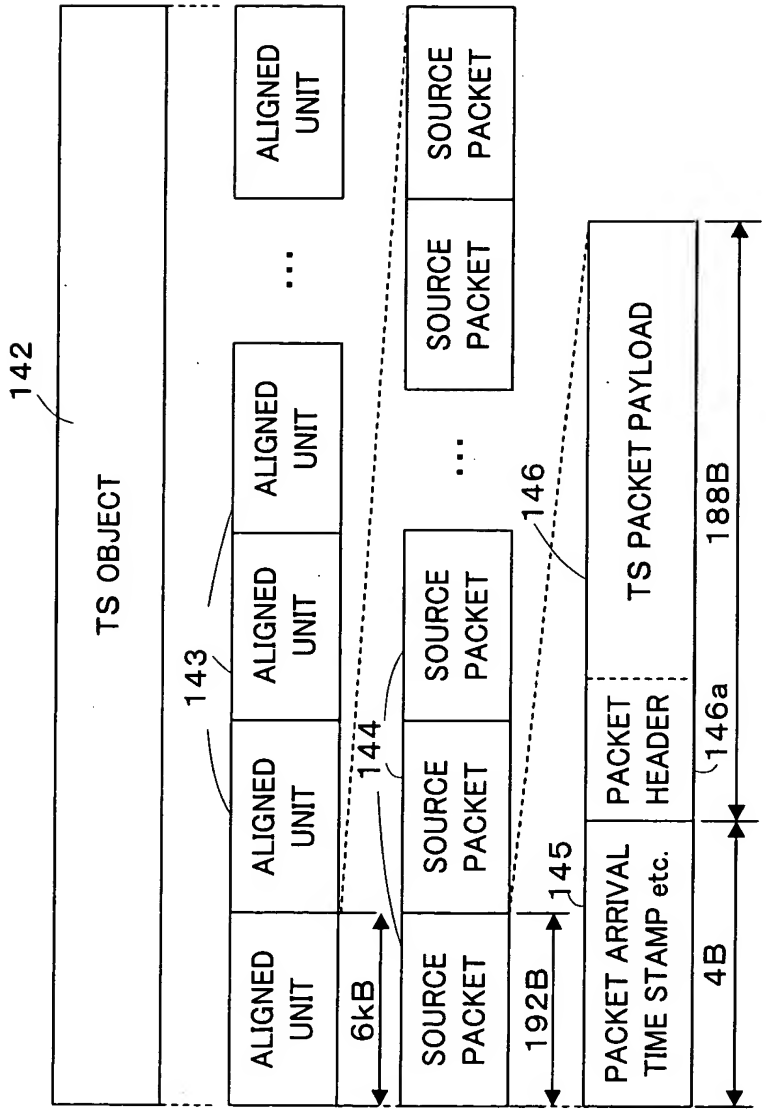

142
TS OBJECT
143
ALIGNED UNIT
ALIGNED UNIT
ALIGNED UNIT
...
ALIGNED UNIT
144
SOURCE PACKET
SOURCE PACKET
SOURCE PACKET
...
SOURCE PACKET
146
TS PACKET PAYLOAD
PACKET HEADER
146a
188B
PACKET ARRIVAL TIME STAMP etc.
4B
145
192B
6kB

FIG. 11

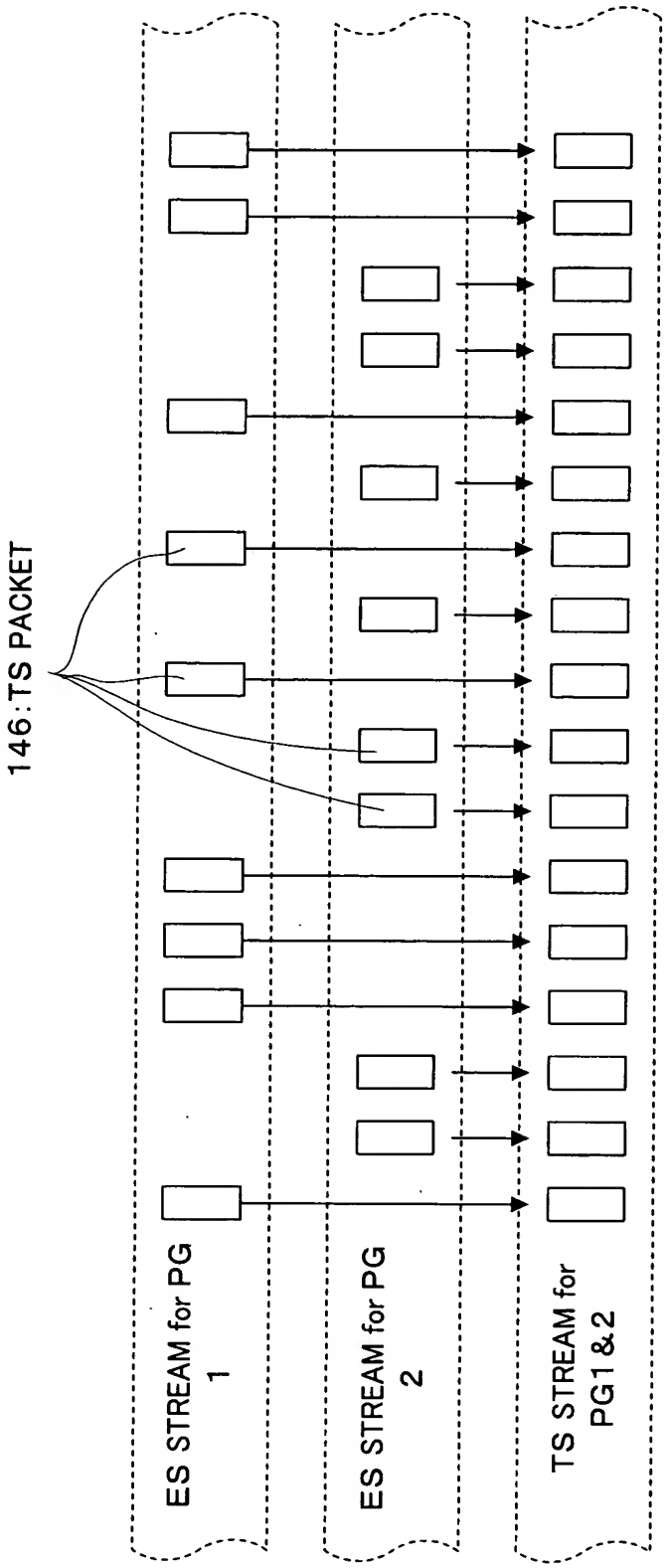

146:TS PACKET
ES STREAM for PG 1
ES STREAM for PG 2
TS STREAM for PG1 &2

FIG. 12

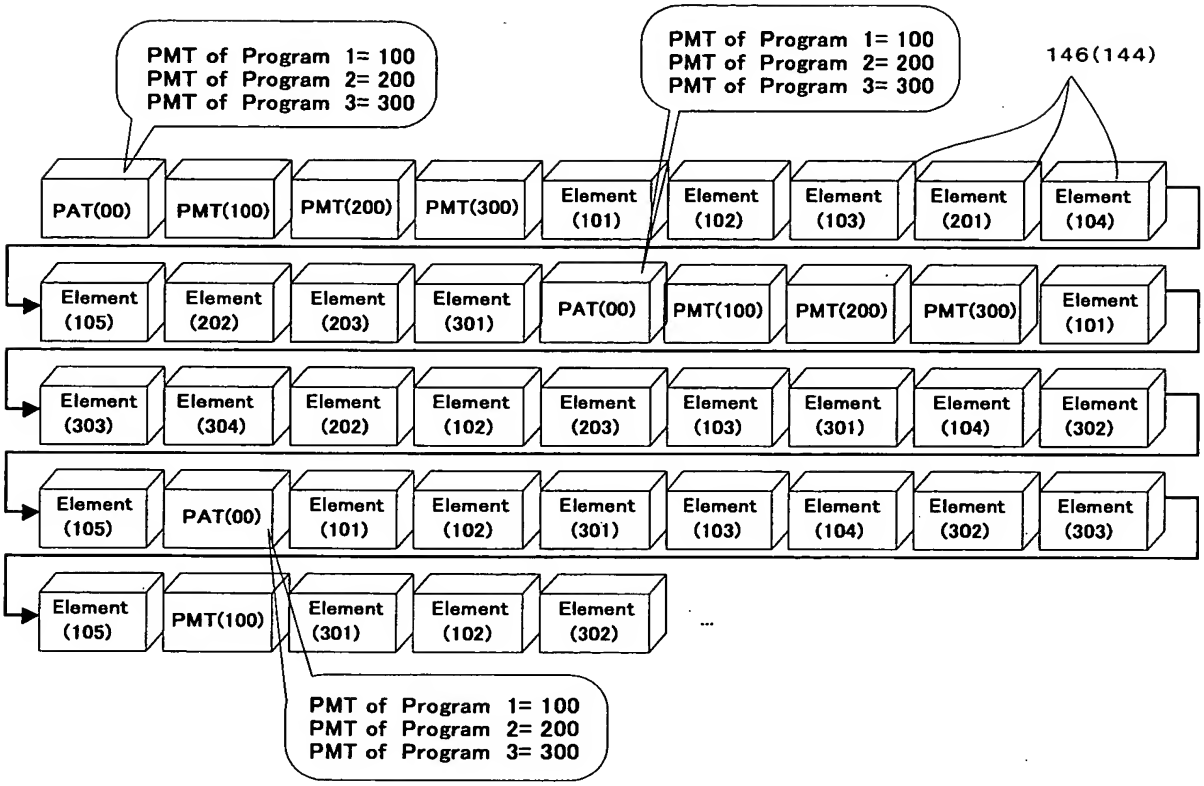

PMT of Program 1= 100
PMT of Program 2= 200
PMT of Program 3= 300
PMT of Program 1= 100
PMT of Program 2= 200
PMT of Program 3= 300
146(144)
PAT(00)
PMT(100)
PMT(200)
PMT(300)
Element (101)
Element (102)
Element (103)
Element (201)
Element (104)
Element (105)
Element (202)
Element (203)
Element (301)
PAT(00)
PMT(100)
PMT(200)
PMT(300)
Element (101)
Element (303)
Element (304)
Element (202)
Element (102)
Element (203)
Element (103)
Element (301)
Element (104)
Element (302)
Element (105)
PAT(00)
Element (101)
Element (102)
Element (301)
Element (103)
Element (104)
Element (302)
Element (303)
Element (105)
PMT(100)
Element (301)
Element (102)
Element (302)
...
PMT of Program 1= 100
PMT of Program 2= 200
PMT of Program 3= 300

FIG. 13

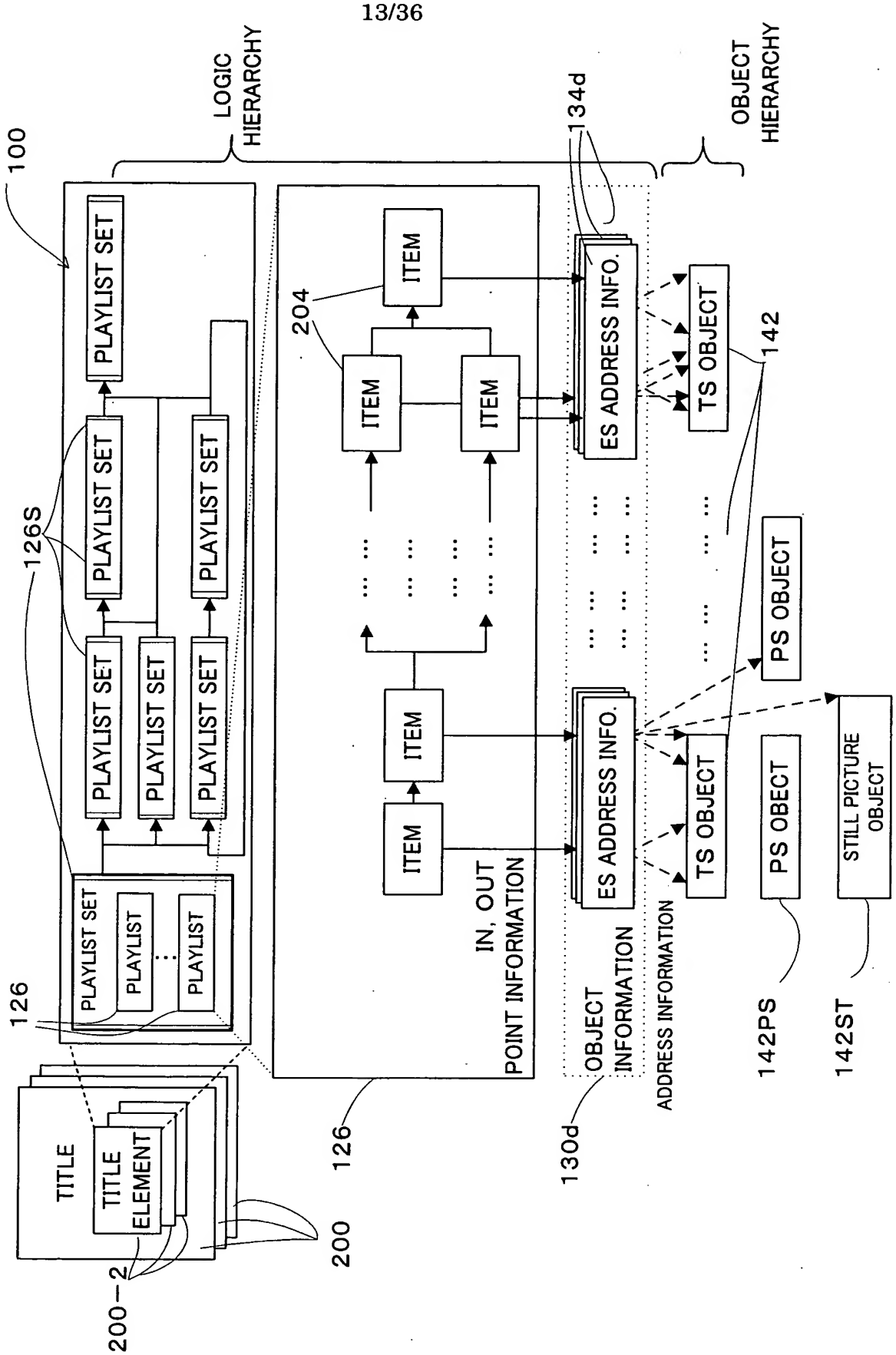

LOGIC HIERARCHY
OBJECT HIERARCHY
100
PLAYLIST SET
126S
PLAYLIST
126
TITLE
TITLE ELEMENT
200
200-2
204
ITEM
IN, OUT POINT INFORMATION
134d
ES ADDRESS INFO.
TS OBJECT
142
PS OBJECT
142PS
STILL PICTURE OBJECT
142ST
OBJECT INFORMATION
ADDRESS INFORMATION
130d

FIG. 14

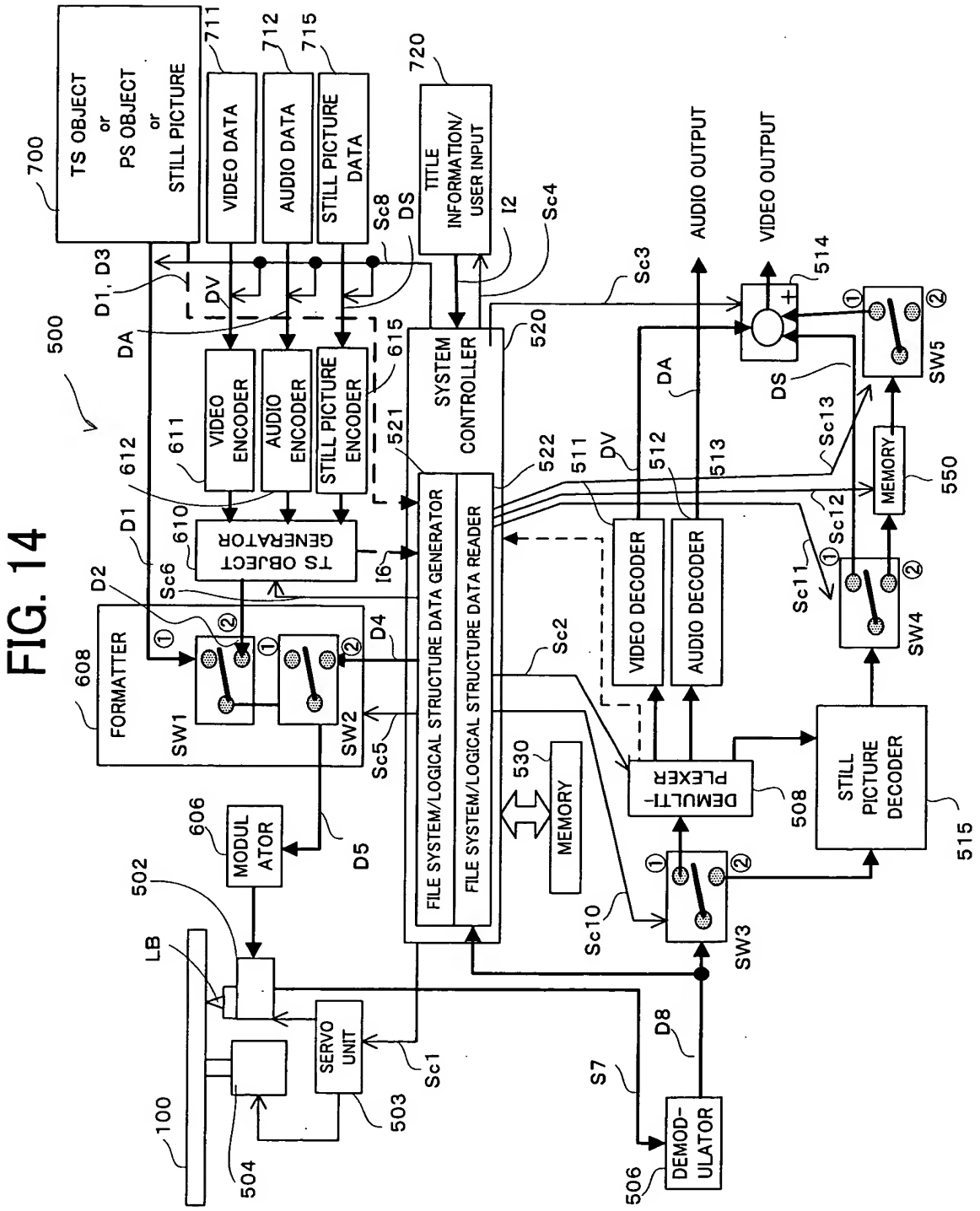

700
TS OBJECT or PS OBJECT or STILL PICTURE
711
VIDEO DATA
712
AUDIO DATA
715
STILL PICTURE DATA
720
TITLE INFORMATION/ USER INPUT
AUDIO OUTPUT
VIDEO OUTPUT
500
D1, D3
DV
DA
DS
I2
Sc4
Sc3
514
615
520
SYSTEM CONTROLLER
SW5
611
VIDEO ENCODER
AUDIO ENCODER
STILL PICTURE ENCODER
521
522
511
512
513
Sc13
MEMORY
550
612
D1
610
TS OBJECT GENERATOR
I6
Sc12
Sc11
SW4
D2
Sc6
608
FORMATTER
SW1
SW2
D4
Sc5
Sc2
VIDEO DECODER
AUDIO DECODER
FILE SYSTEM/LOGICAL STRUCTURE DATA GENERATOR
FILE SYSTEM/LOGICAL STRUCTURE DATA READER
530
MEMORY
606
MODUL ATOR
D5
DEMULTI- PLEXER
508
STILL PICTURE DECODER
515
502
LB
Sc10
SW3
SERVO UNIT
Sc1
D8
S7
503
100
504
506
DEMOD- ULATOR

FIG. 15

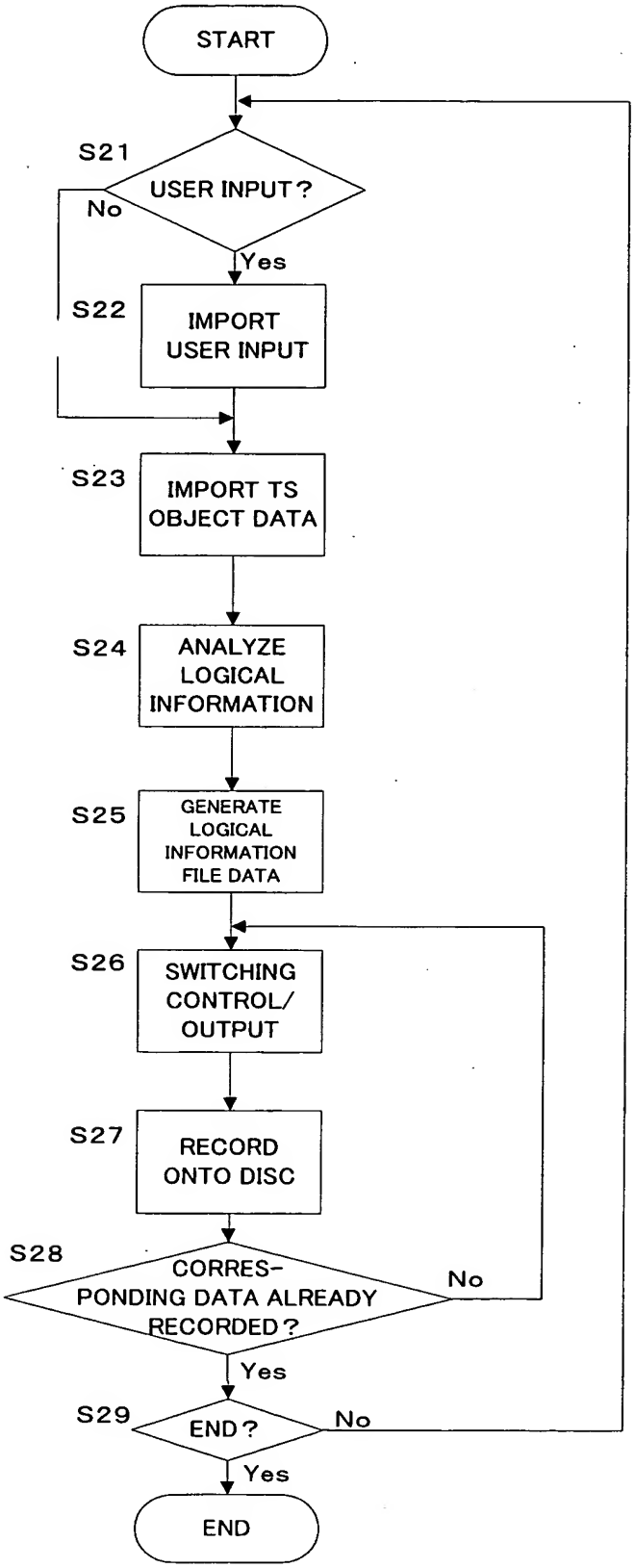

START
S21
USER INPUT?
No
Yes
S22
IMPORT USER INPUT
S23
IMPORT TS OBJECT DATA
S24
ANALYZE LOGICAL INFORMATION
S25
GENERATE LOGICAL INFORMATION FILE DATA
S26
SWITCHING CONTROL/ OUTPUT
S27
RECORD ONTO DISC
S28
CORRES-PONDING DATA ALREADY RECORDED?
No
Yes
S29
END?
No
Yes
END

FIG. 16

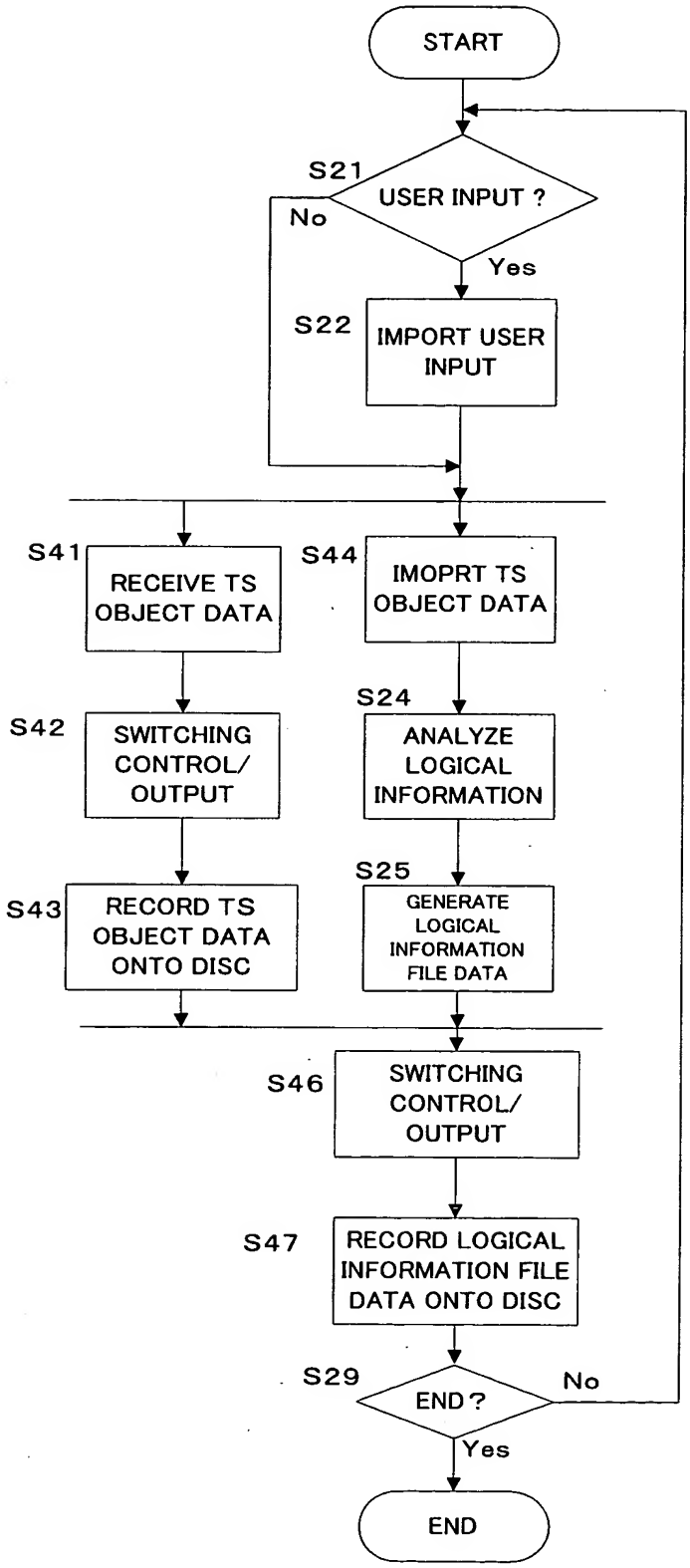

START
S21
USER INPUT ?
No
Yes
S22
IMPORT USER INPUT
S41
RECEIVE TS OBJECT DATA
S44
IMOPRT TS OBJECT DATA
S42
SWITCHING CONTROL/ OUTPUT
S24
ANALYZE LOGICAL INFORMATION
S43
RECORD TS OBJECT DATA ONTO DISC
S25
GENERATE LOGICAL INFORMATION FILE DATA
S46
SWITCHING CONTROL/ OUTPUT
S47
RECORD LOGICAL INFORMATION FILE DATA ONTO DISC
S29
END ?
No
Yes
END

FIG. 17

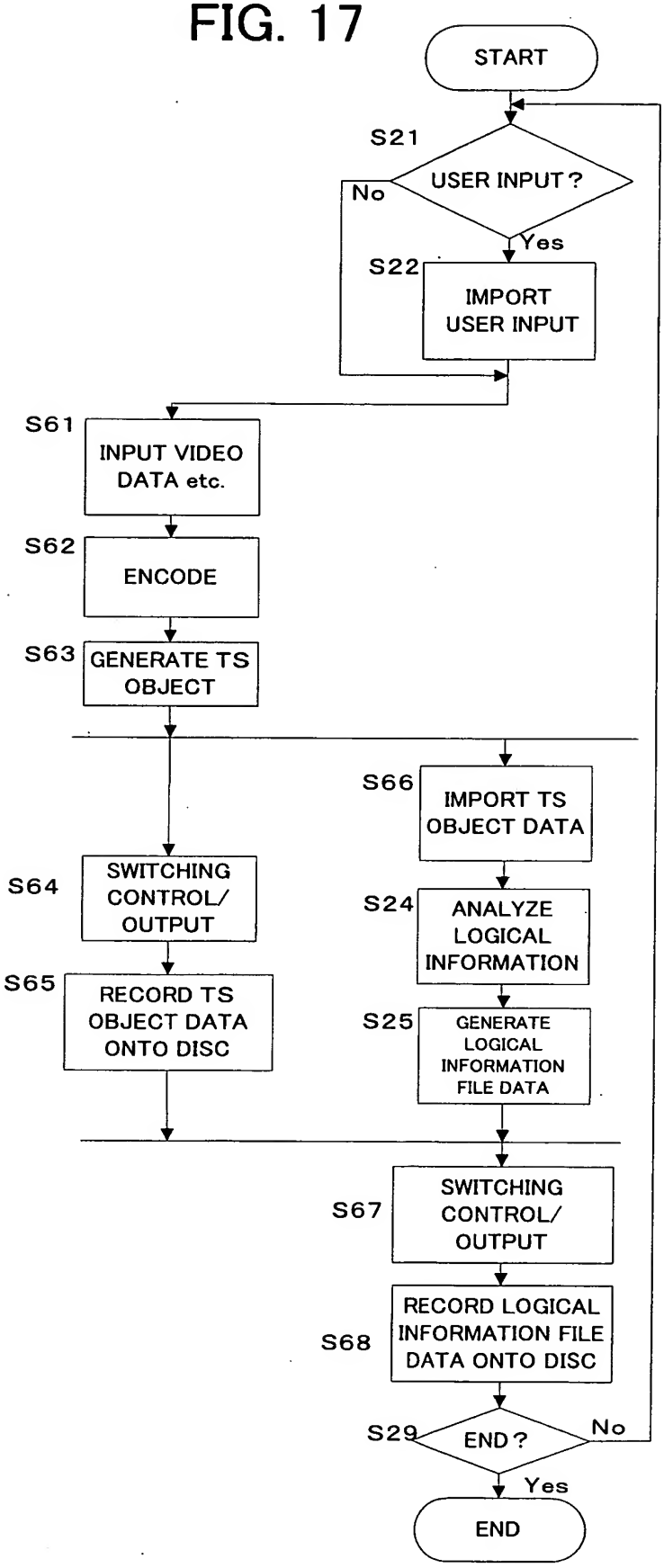

START
S21
USER INPUT ?
No
Yes
S22
IMPORT USER INPUT
S61
INPUT VIDEO DATA etc.
S62
ENCODE
S63
GENERATE TS OBJECT
S66
IMPORT TS OBJECT DATA
S64
SWITCHING CONTROL/ OUTPUT
S24
ANALYZE LOGICAL INFORMATION
S65
RECORD TS OBJECT DATA ONTO DISC
S25
GENERATE LOGICAL INFORMATION FILE DATA
S67
SWITCHING CONTROL/ OUTPUT
S68
RECORD LOGICAL INFORMATION FILE DATA ONTO DISC
S29
END ?
No
Yes
END

FIG. 18

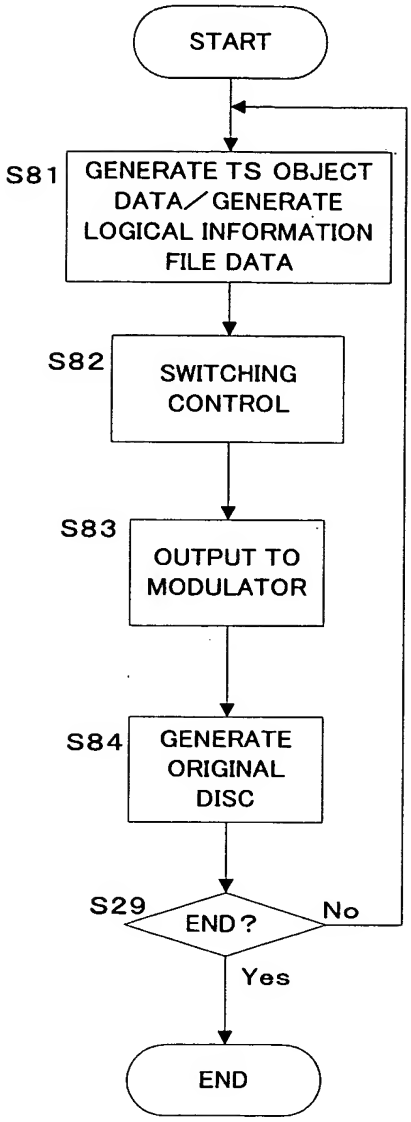

START
S81
GENERATE TS OBJECT DATA／GENERATE LOGICAL INFORMATION FILE DATA
S82
SWITCHING CONTROL
S83
OUTPUT TO MODULATOR
S84
GENERATE ORIGINAL DISC
S29
END?
No
Yes
END

FIG. 19

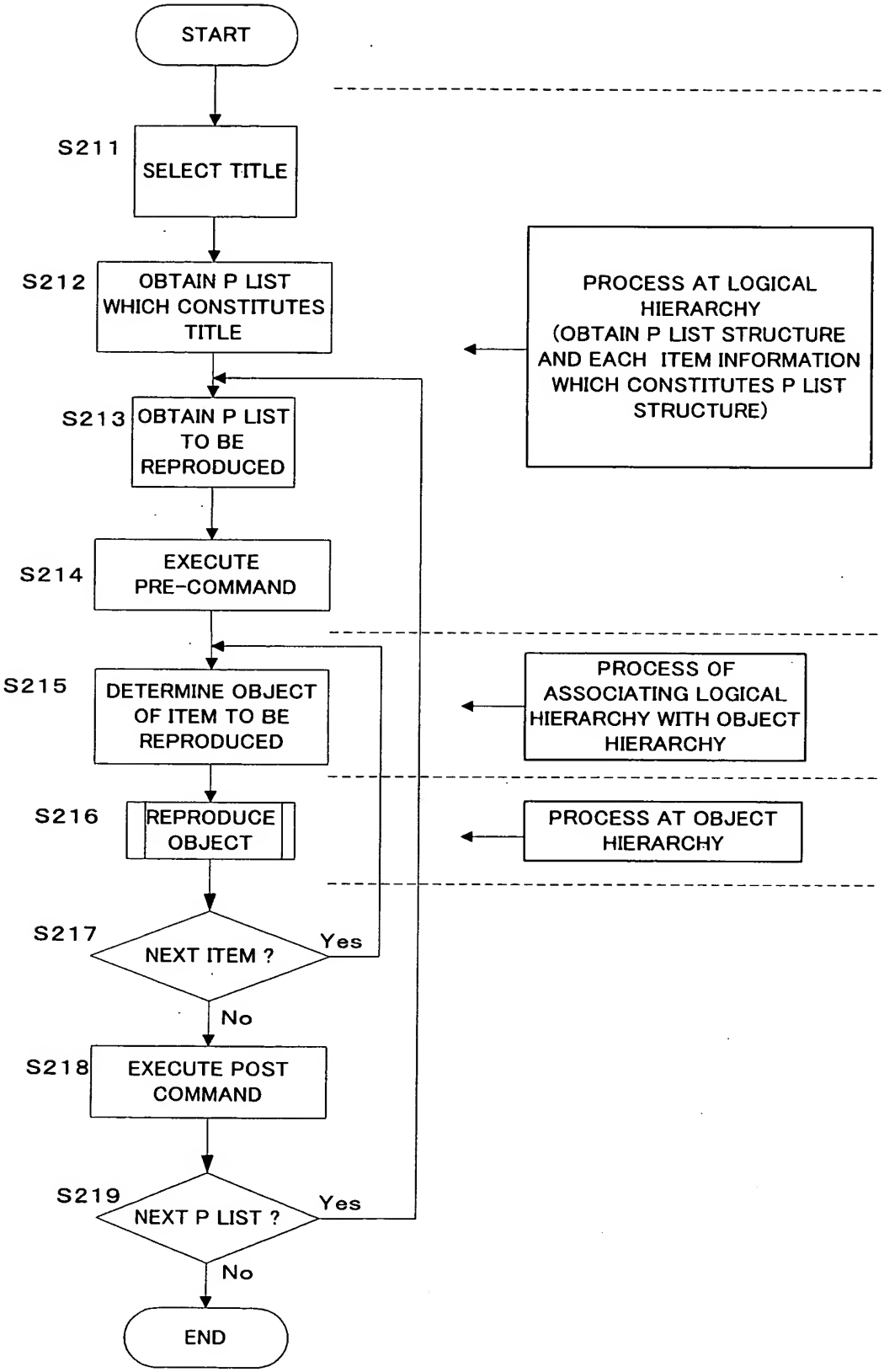

START
S211
SELECT TITLE
S212
OBTAIN P LIST WHICH CONSTITUTES TITLE
PROCESS AT LOGICAL HIERARCHY (OBTAIN P LIST STRUCTURE AND EACH ITEM INFORMATION WHICH CONSTITUTES P LIST STRUCTURE)
S213
OBTAIN P LIST TO BE REPRODUCED
S214
EXECUTE PRE-COMMAND
S215
DETERMINE OBJECT OF ITEM TO BE REPRODUCED
PROCESS OF ASSOCIATING LOGICAL HIERARCHY WITH OBJECT HIERARCHY
S216
REPRODUCE OBJECT
PROCESS AT OBJECT HIERARCHY
S217
NEXT ITEM ?
Yes
No
S218
EXECUTE POST COMMAND
S219
NEXT P LIST ?
Yes
No
END

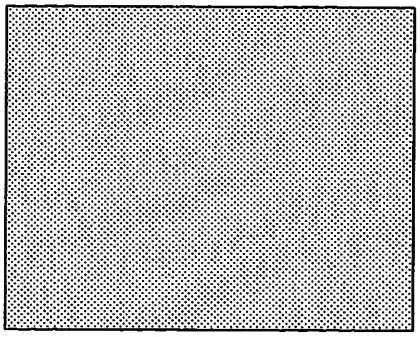
FIG. 20(a)

header	Size, Display Position etc. of Background Image etc.
Background Image Data	Image Data

FIG. 20(b)

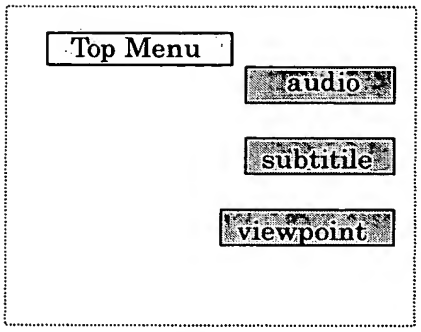
301

header	Quantity of Button Pages, Quantity of Button Images, etc.		
Button Page Info.	Button Page #1 (301p)	Button #1	Button Image No.
			Display Position
			Near-by Button Info.
			Button Command
		• • •	
		Button #x	Button Image No.
			Display Position
			Near-by Button Info.
			Button Command
	• • •		
	Button Page #m (301p)	Button #1	Button Image No.
			Display Position
			Near-by Button Info.
			Button Command
		• • •	
		Button #y	Button Image No.
			Display Position
			Near-by Button Info.
			Button Command
Button Image	Button Image Data #1		
	• • •		
	Button Image Data #n		



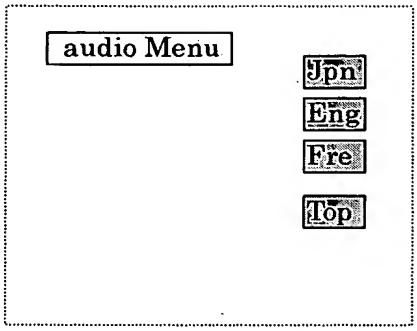
Background Image

FIG. 21(a)



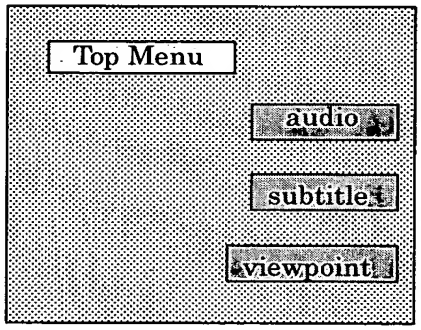
Button Page #1

FIG. 21(b)



Button Page #2

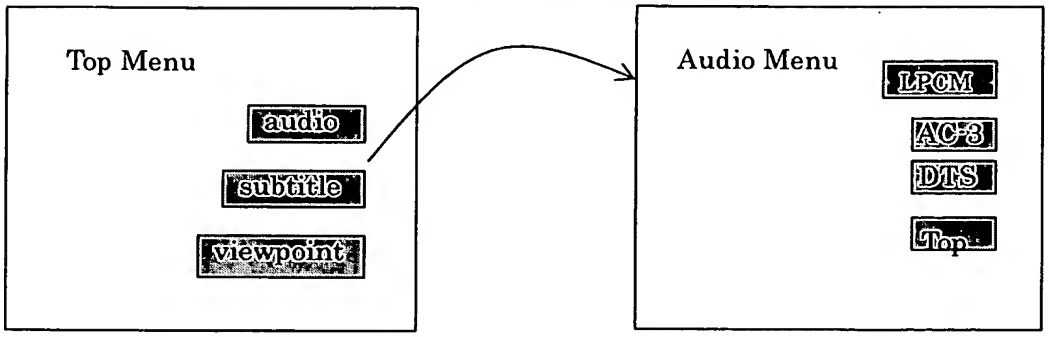
FIG. 21(c)



Display on Screen

FIG. 21(d)

[Button Data #1] (Attribute : Support DTS)
Data having a Button Structure in which LPCM, AC-3, and DTS can be selected as Audio



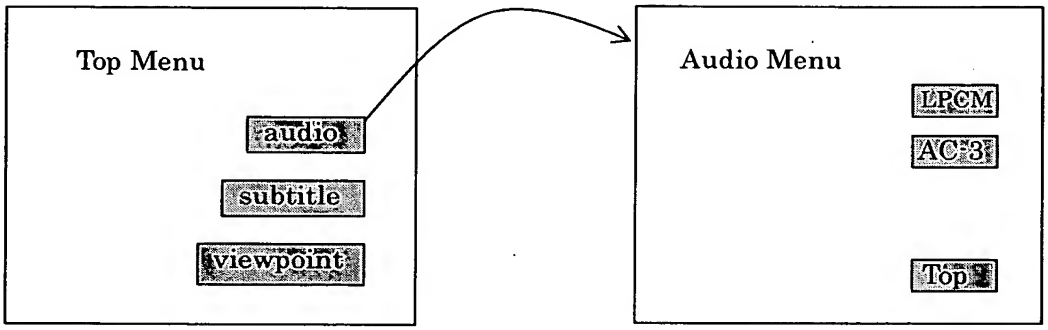
Button Page #1

FIG.22(a)

Button Page #2

FIG. 22(b)

[Button Data #2] (Attribute : Not Support DTS)
Data having a Button Structure in which only LPCM and AC-3 can be selected as Audio



Button Page #1

FIG. 22(c)

Button Page #2

FIG. 22(d)

FIG. 23

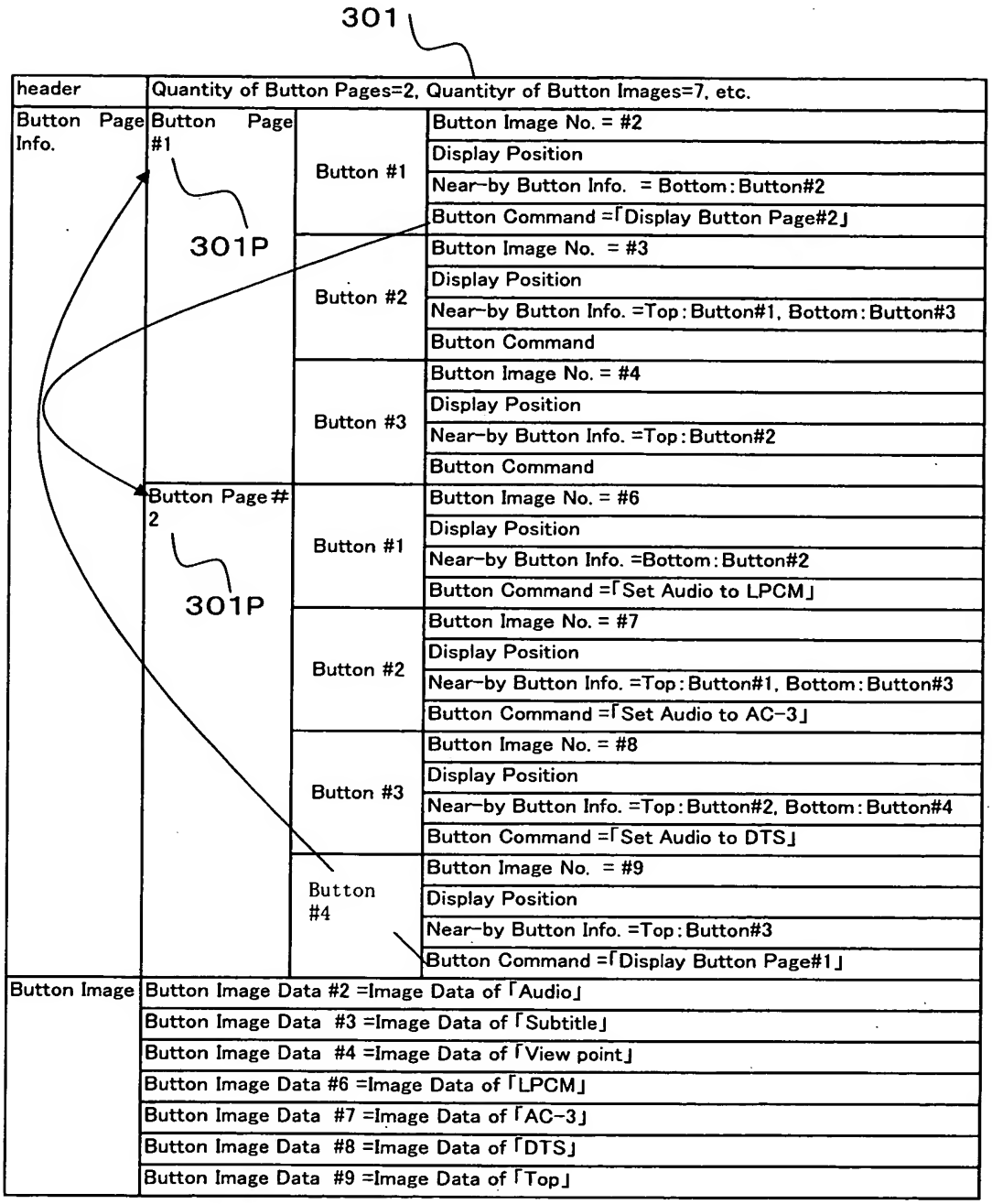

301
header
Quantity of Button Pages=2, Quantityr of Button Images=7, etc.
Button Page Info.
Button Page #1
301P
Button #1
Button Image No. = #2
Display Position
Near-by Button Info. = Bottom: Button#2
Button Command =「Display Button Page#2」
Button #2
Button Image No. = #3
Display Position
Near-by Button Info. =Top: Button#1, Bottom: Button#3
Button Command
Button #3
Button Image No. = #4
Display Position
Near-by Button Info. =Top: Button#2
Button Command
Button Page #2
301P
Button #1
Button Image No. = #6
Display Position
Near-by Button Info. =Bottom: Button#2
Button Command =「Set Audio to LPCM」
Button #2
Button Image No. = #7
Display Position
Near-by Button Info. =Top: Button#1, Bottom: Button#3
Button Command =「Set Audio to AC-3」
Button #3
Button Image No. = #8
Display Position
Near-by Button Info. =Top: Button#2, Bottom: Button#4
Button Command =「Set Audio to DTS」
Button #4
Button Image No. = #9
Display Position
Near-by Button Info. =Top: Button#3
Button Command =「Display Button Page#1」
Button Image
Button Image Data #2 =Image Data of「Audio」
Button Image Data #3 =Image Data of「Subtitle」
Button Image Data #4 =Image Data of「View point」
Button Image Data #6 =Image Data of「LPCM」
Button Image Data #7 =Image Data of「AC-3」
Button Image Data #8 =Image Data of「DTS」
Button Image Data #9 =Image Data of「Top」

FIG. 24

301

[Button Data#2]

header	Quantity of Button Pages=2, Quantity of Button Images=6, etc.		
Button Page Info.	Button Page#1 301p	Button #1	Button Image No. = #2
			Display Position
			Near-by Button Info. = Bottom: Button#2
			Button Command =「Display Button Page#2」
		Button #2	Button Image No. = #3
			Display Position
			Near-by Button Info. =Top: Button#1, Bottom: Button#3
			Button Command
		Button #3	Button Image No. = #4
			Display Position
			Near-by Button Info. =Top: Button#2
			Button Command
	Button Page#2 301p	Button #1	Button Image No. = #6
			Display Position
			Near-by Button Info. =Bottom: Button#2
			Button Command =「Set Audio to LPCM」
		Button #2	Button Image No. = #7
			Display Position
			Near-by Button Info. =Top: Button#1, Bottom: Button#3
			Button Command =「Set Audio to AC-3」
		Button #3	Button Image No. = #9
			Display Position
			Near-by Button Info. =Top: Button#2
			Button Command =「Display Button Page#1」
Button Image	Button Image Data #2 =Image Data of「Audio」		
	Button Image Data #3 =Image Data of「Subtitle」		
	Button Image Data #4 =Image Data of「View point」		
	Button Image Data #6 =Image Data of「LPCM」		
	Button Image Data #7 =Image Data of「AC-3」		
	Button Image Data #9 =Image Data of「Top」		

FIG. 25

P List Info. table

Field Name			Description Content
P List General Info.			P list size, total P list quantity, etc.
P List Pointer table	P List #1 Pointer		P list#1 Info. Storage Address
	P List #2 Pointer		P list#2 Info. Storage Address
P list #1 Info. table	P List #1 General Info.		Item total quantity which constitutes P list #1 = 2, Sub-Item total quantity = 1, Other info.
	P List #1 Item Info. table	Item#1 Info.	Relevant AU number in Au table in Object Info. File, etc.
		Item#2 Info.	Relevant AU number in Au table in Object Info. File, etc.
	P List #1 Sub-Item Info. table	Sub-Item #1 Info.	Type=menu during playback content, Relevant AU number in Object Info. File, etc.
	Other Info.		Others
P list #2 Info. table	P List #2 General Info.		Item total quantity which constitutes P list #1 = 1, Sub-Item total quantity = 1, Other info.
	P List #2 Item Info. table	Item#1 Info.	Relevant AU number in Au table in Object Info. File, etc.
	P List #2 Sub-Item Info. table	Sub-Item #1 Info.	Type=menu during playback content, Relevant AU number in Object Info. File, etc.
	Other Info.		Others

FIG. 26

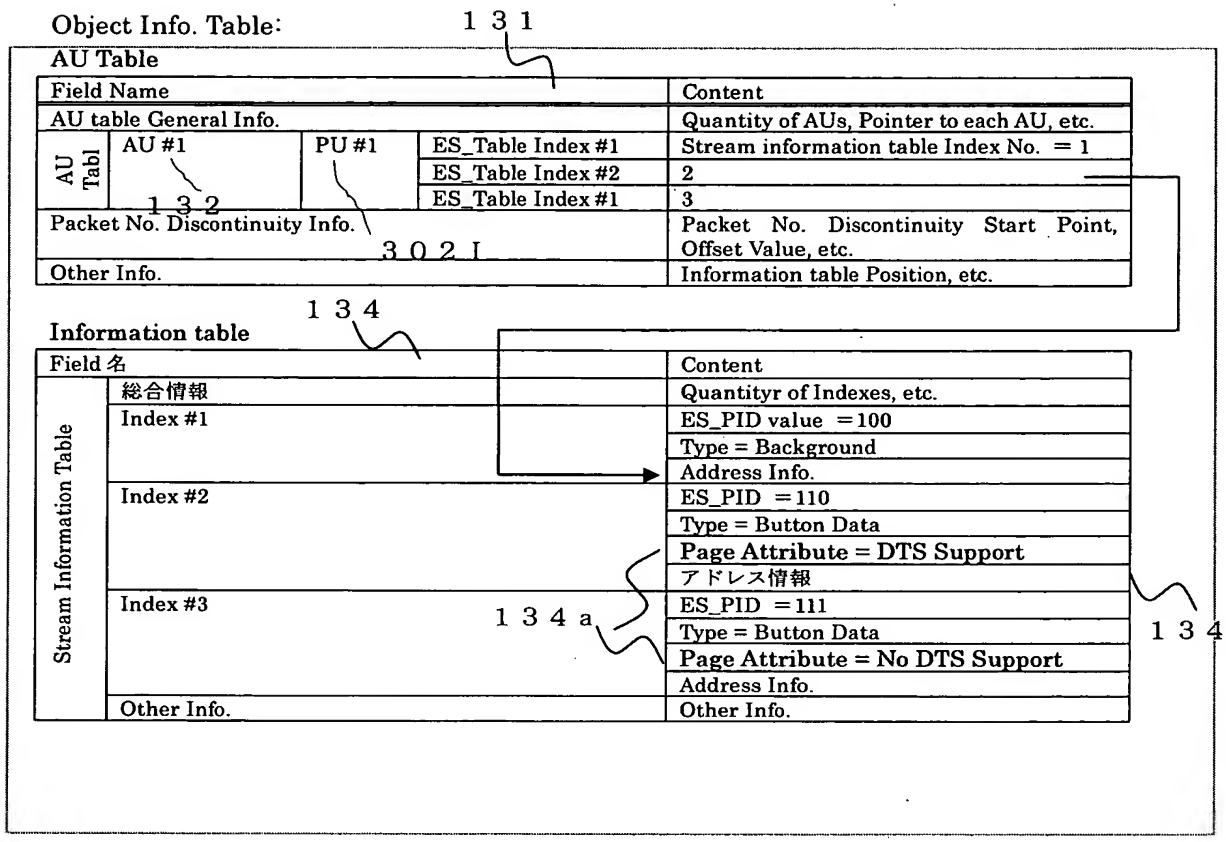

Object Info. Table:
131
AU Table
Field Name
Content
AU table General Info.
Quantity of AUs, Pointer to each AU, etc.
AU Tabl
AU #1
PU #1
ES_Table Index #1
Stream information table Index No. = 1
ES_Table Index #2
2
ES_Table Index #1
3
132
Packet No. Discontinuity Info.
3021
Packet No. Discontinuity Start Point, Offset Value, etc.
Other Info.
Information table Info.
134
Information table
Field 名
Content
Stream Information Table
総合情報
Quantityr of Indexes, etc.
Index #1
ES_PID value =100
Type = Background
Address Info.
Index #2
ES_PID =110
Type = Button Data
Page Attribute = DTS Support
アドレス情報
Index #3
ES_PID =111
134a
Type = Button Data
Page Attribute = No DTS Support
Address Info.
Other Info.
Other Info.
134d

FIG. 27

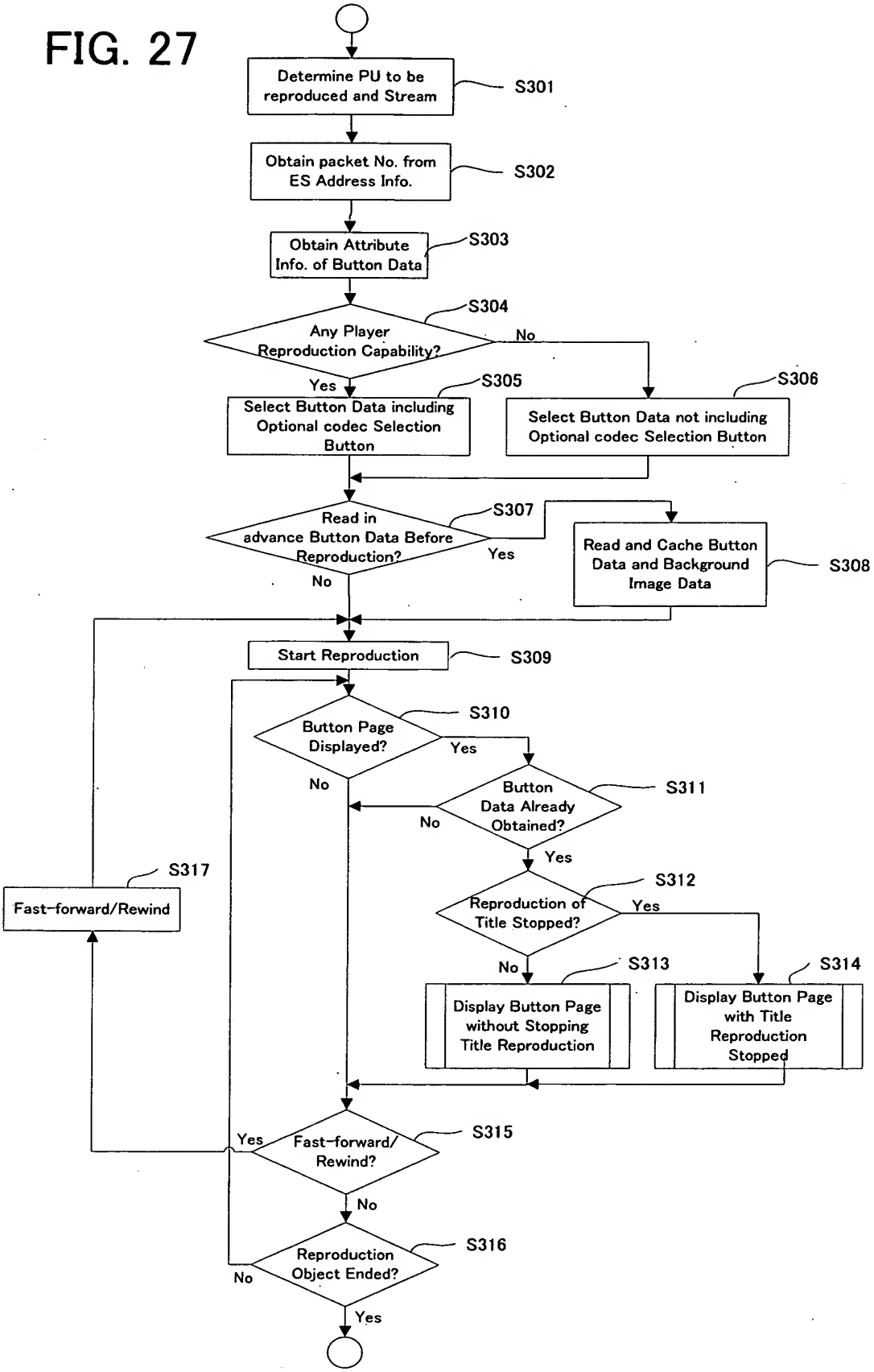

Determine PU to be reproduced and Stream
S301
Obtain packet No. from ES Address Info.
S302
Obtain Attribute Info. of Button Data
S303
Any Player Reproduction Capability?
S304
No
Yes
Select Button Data including Optional codec Selection Button
S305
Select Button Data not including Optional codec Selection Button
S306
Read in advance Button Data Before Reproduction?
S307
Yes
No
Read and Cache Button Data and Background Image Data
S308
Start Reproduction
S309
Button Page Displayed?
S310
Yes
No
Button Data Already Obtained?
S311
No
Yes
Reproduction of Title Stopped?
S312
Yes
No
Display Button Page without Stopping Title Reproduction
S313
Display Button Page with Title Reproduction Stopped
S314
Fast-forward/Rewind
S317
Fast-forward/ Rewind?
S315
Yes
No
Reproduction Object Ended?
S316
No
Yes

FIG. 28

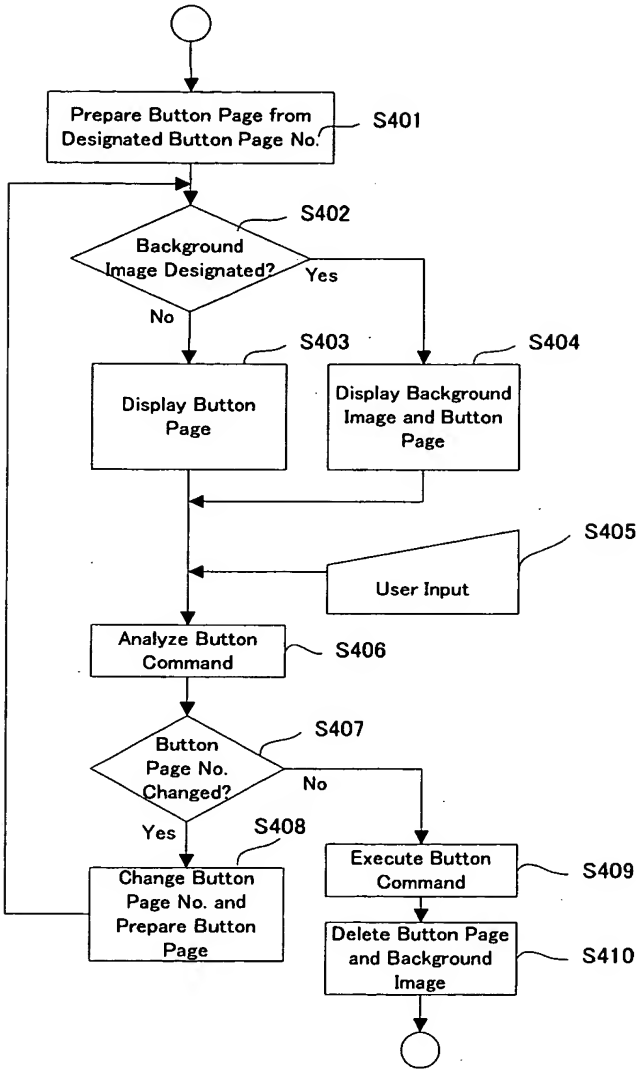

Prepare Button Page from Designated Button Page No.
S401
S402
Background Image Designated?
Yes
No
S403
S404
Display Button Page
Display Background Image and Button Page
S405
User Input
Analyze Button Command
S406
S407
Button Page No. Changed?
No
Yes
S408
Change Button Page No. and Prepare Button Page
Execute Button Command
S409
Delete Button Page and Background Image
S410

FIG. 29

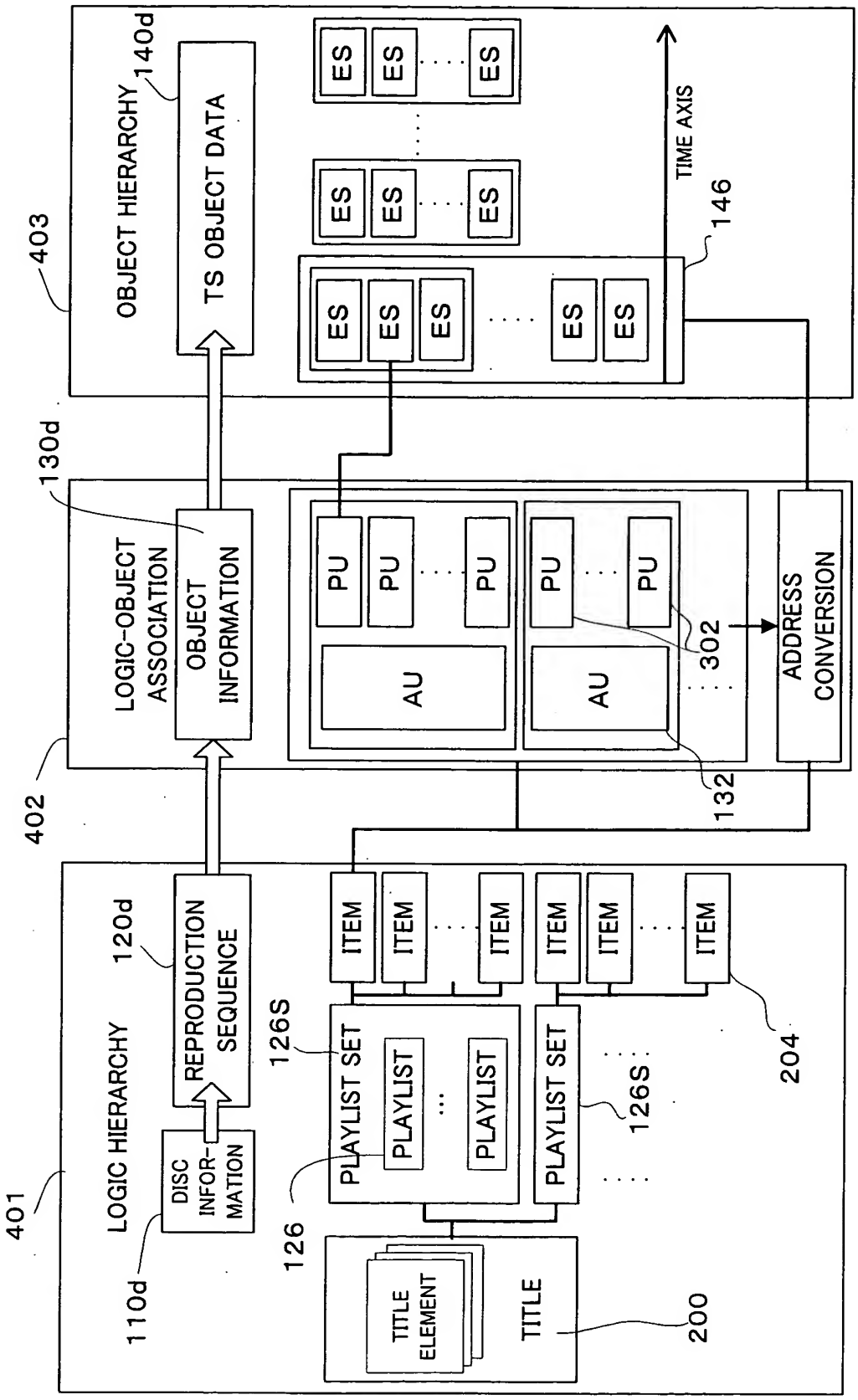

403
OBJECT HIERARCHY
140d
TS OBJECT DATA
ES
TIME AXIS
146
130d
LOGIC-OBJECT ASSOCIATION
OBJECT INFORMATION
PU
AU
302
ADDRESS CONVERSION
132
402
401
LOGIC HIERARCHY
120d
REPRODUCTION SEQUENCE
ITEM
126S
PLAYLIST SET
PLAYLIST
204
DISC INFOR-MATION
110d
126
TITLE ELEMENT
TITLE
200

FIG. 30

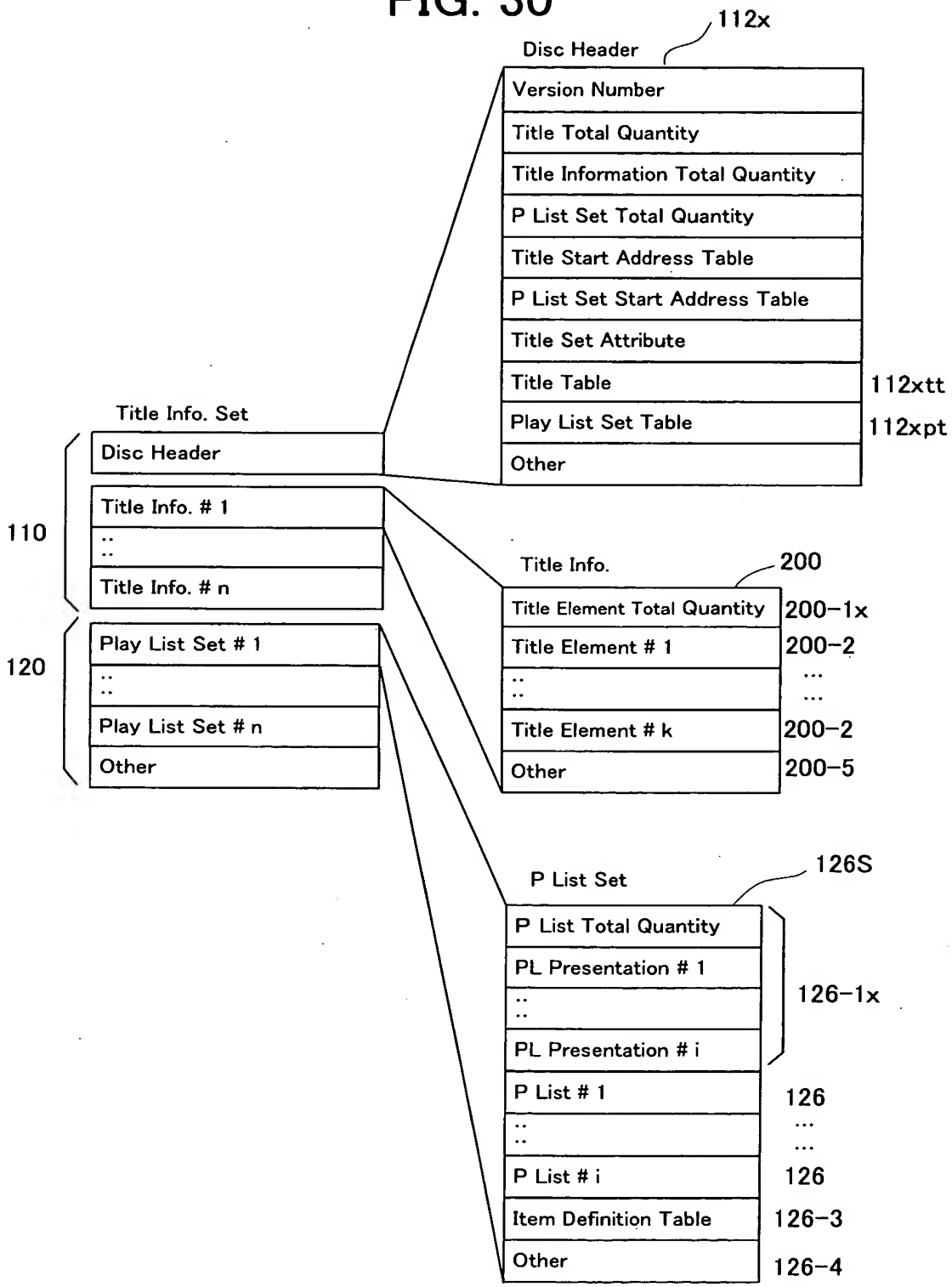

112x
Disc Header
Version Number
Title Total Quantity
Title Information Total Quantity
P List Set Total Quantity
Title Start Address Table
P List Set Start Address Table
Title Set Attribute
Title Table
112xtt
Play List Set Table
112xpt
Other
Title Info. Set
Disc Header
Title Info. # 1
Title Info. # n
110
Play List Set # 1
Play List Set # n
120
Other
Title Info.
200
Title Element Total Quantity
200-1x
Title Element # 1
200-2
Title Element # k
200-2
Other
200-5
P List Set
126S
P List Total Quantity
PL Presentation # 1
PL Presentation # i
126-1x
P List # 1
126
P List # i
126
Item Definition Table
126-3
Other
126-4

FIG. 31

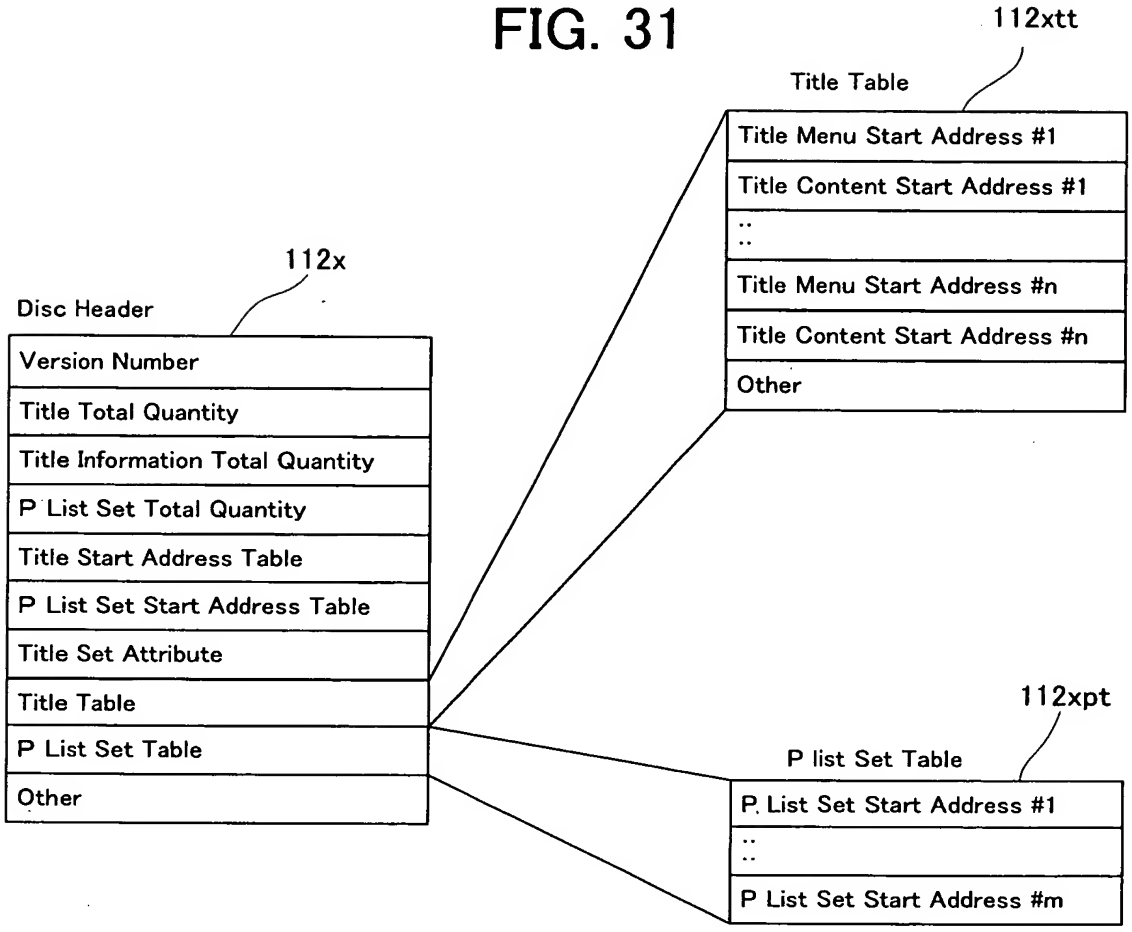

112xtt
Title Table
Title Menu Start Address #1
Title Content Start Address #1
..
..
Title Menu Start Address #n
Title Content Start Address #n
Other
112x
Disc Header
Version Number
Title Total Quantity
Title Information Total Quantity
P List Set Total Quantity
Title Start Address Table
P List Set Start Address Table
Title Set Attribute
Title Table
P List Set Table
Other
112xpt
P list Set Table
P List Set Start Address #1
..
..
P List Set Start Address #m

FIG. 32

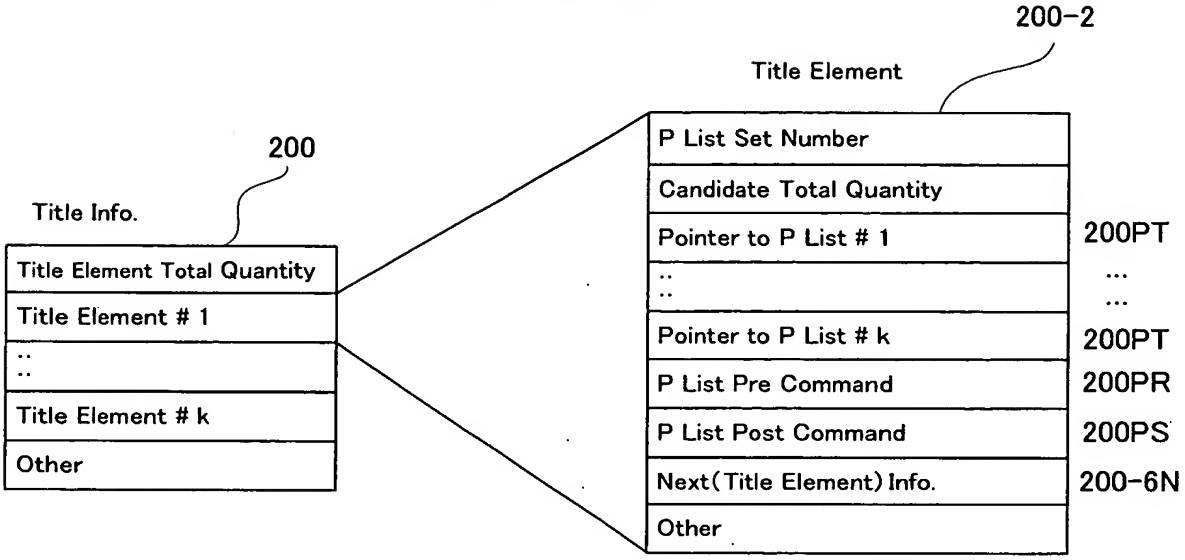

200-2
Title Element
200
Title Info.
Title Element Total Quantity
Title Element # 1
Title Element # k
Other
P List Set Number
Candidate Total Quantity
Pointer to P List # 1
Pointer to P List # k
P List Pre Command
P List Post Command
Next(Title Element) Info.
Other
200PT
200PT
200PR
200PS
200-6N

FIG. 33

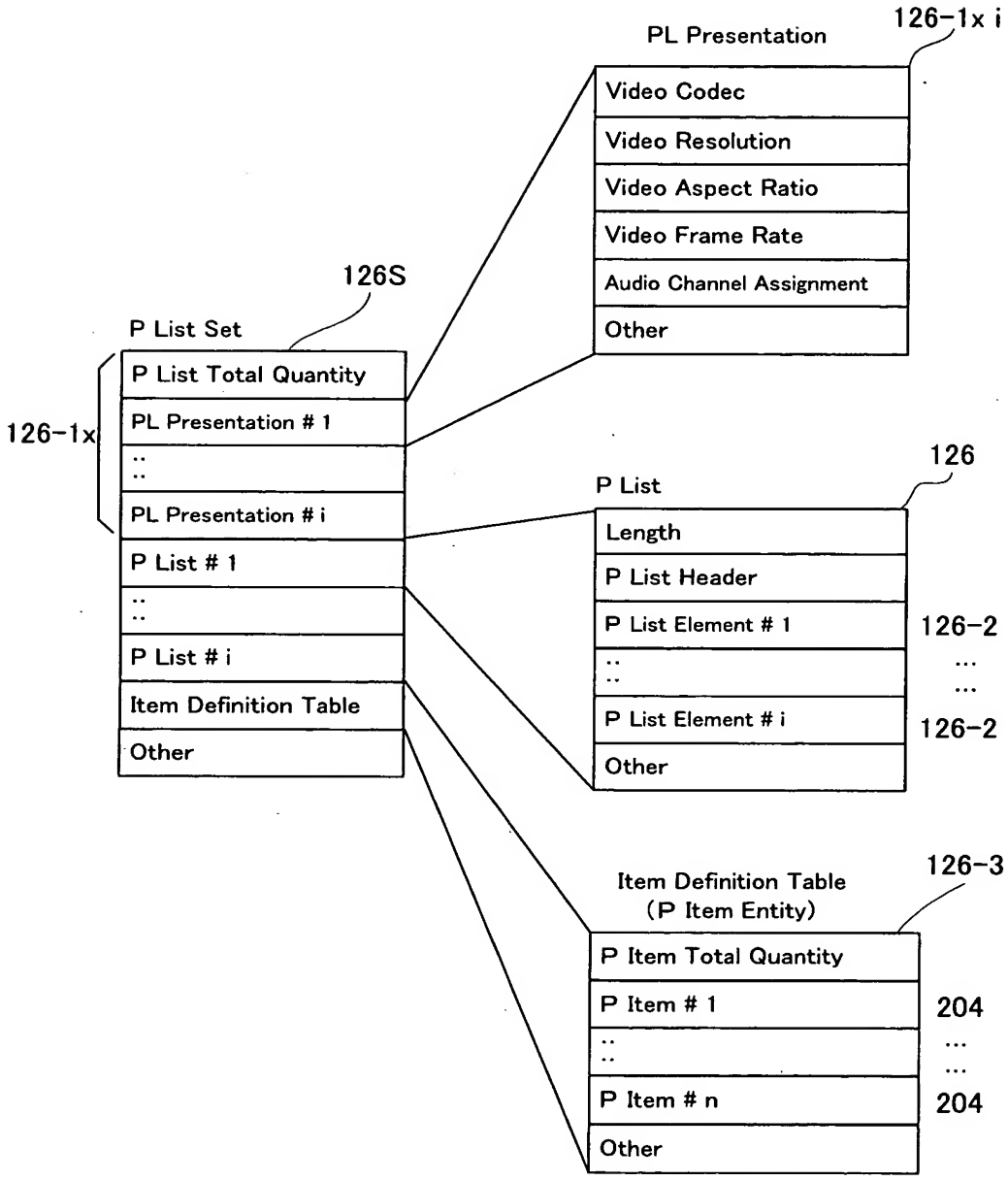

126-1x i
PL Presentation
Video Codec
Video Resolution
Video Aspect Ratio
Video Frame Rate
Audio Channel Assignment
Other
126S
P List Set
126-1x
P List Total Quantity
PL Presentation # 1
PL Presentation # i
P List # 1
P List # i
Item Definition Table
Other
126
P List
Length
P List Header
P List Element # 1
P List Element # i
Other
126-2
126-2
126-3
Item Definition Table
(P Item Entity)
P Item Total Quantity
P Item # 1
P Item # n
Other
204
204

FIG. 34

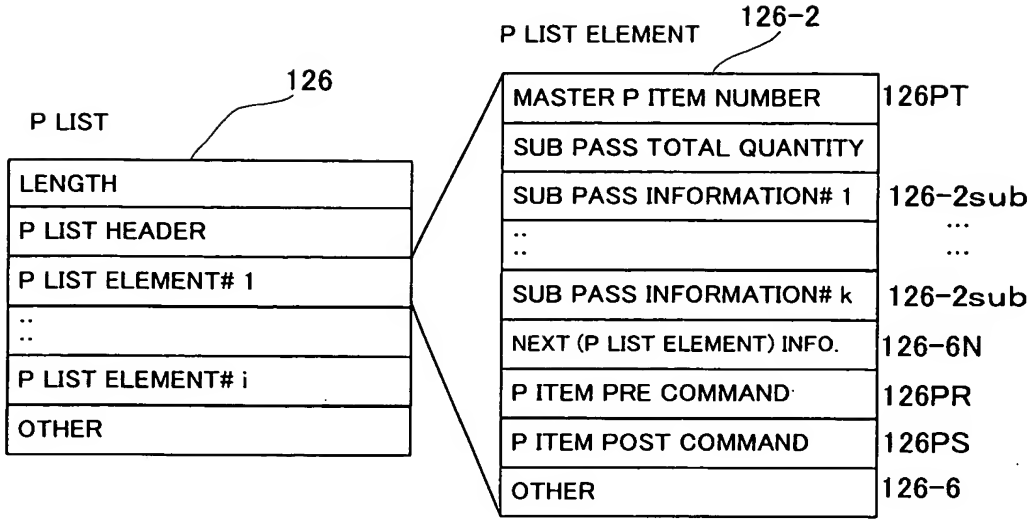

P LIST
126
LENGTH
P LIST HEADER
P LIST ELEMENT# 1
..
..
P LIST ELEMENT# i
OTHER
P LIST ELEMENT
126-2
MASTER P ITEM NUMBER
126PT
SUB PASS TOTAL QUANTITY
SUB PASS INFORMATION# 1
126-2sub
..
..
SUB PASS INFORMATION# k
126-2sub
NEXT (P LIST ELEMENT) INFO.
126-6N
P ITEM PRE COMMAND
126PR
P ITEM POST COMMAND
126PS
OTHER
126-6

FIG. 35

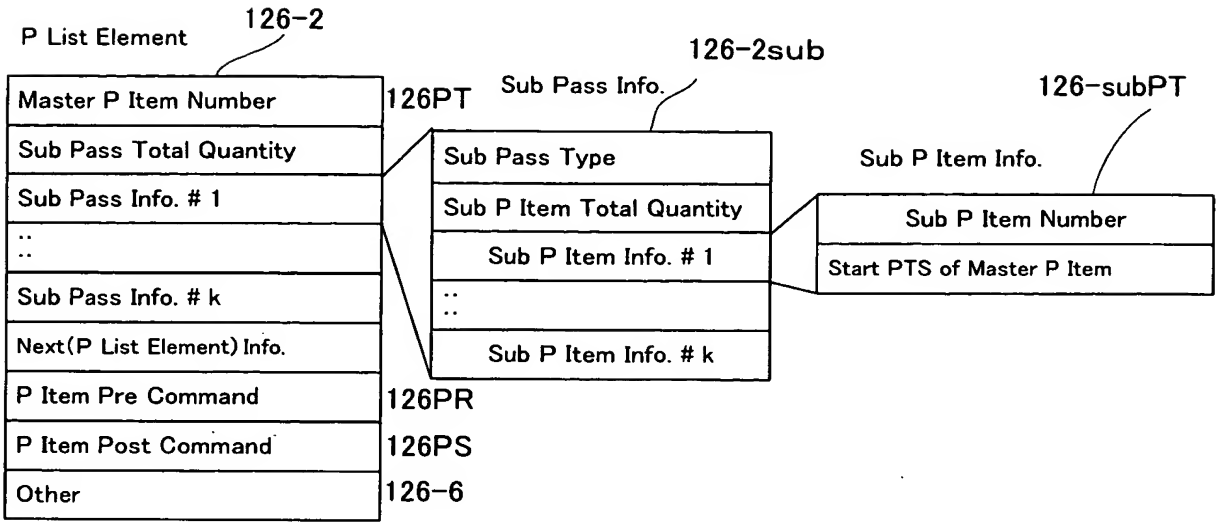
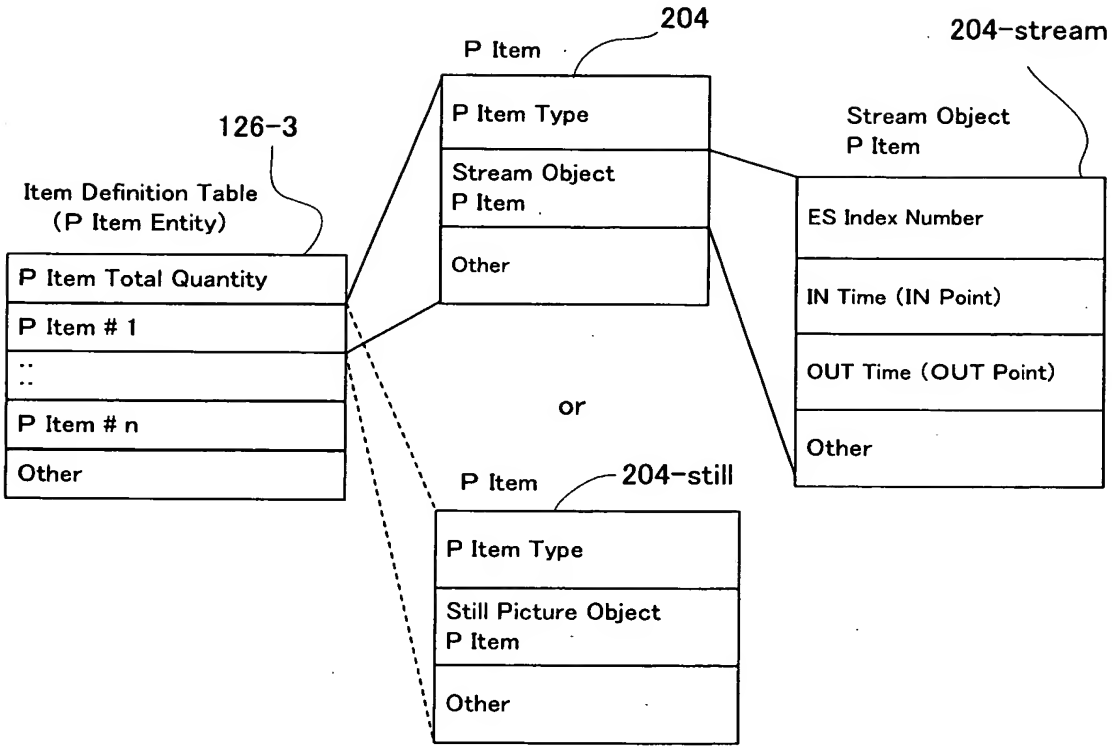

P List Element
126-2
Master P Item Number
126PT
Sub Pass Total Quantity
Sub Pass Info. # 1
Sub Pass Info. # k
Next(P List Element) Info.
P Item Pre Command
126PR
P Item Post Command
126PS
Other
126-6
Sub Pass Info.
126-2sub
Sub Pass Type
Sub P Item Total Quantity
Sub P Item Info. # 1
Sub P Item Info. # k
Sub P Item Info.
126-subPT
Sub P Item Number
Start PTS of Master P Item

FIG. 36


204
P Item
204-stream
126-3
P Item Type
Stream Object P Item
Item Definition Table (P Item Entity)
Stream Object P Item
ES Index Number
P Item Total Quantity
Other
IN Time (IN Point)
P Item # 1
OUT Time (OUT Point)
or
P Item # n
Other
P Item
204-still
P Item Type
Still Picture Object P Item
Other